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Abstracts

(An explanation of the classification used in the Digest was published in the January (1949) issue (Vol. 6, No. 1) on the page facing the Index to Authors)

FIBERS A

Natural fibers A 1

Flax processing and quality. F. Grainger. *J. Textile Inst. (Proc.) 40,* P918-34 (Sept. 1949).

New methods of flax processing which increase production and quality are described. Agricultural processes, such as ground selection and soil type, cultivation, manures, sowing and seeding, weeds, diseases, crop classifications and pulling, harvesting, and transporting are discussed. Under factory processing are discussed storage and de-seeding, seed cleaning, drying, disinfecting, tank setting, drying, turbine scutching, hand dressing, tow scutching, and green or natural flax. Quality and grading and 8 important factors to look for when grading for quality are noted.

Flax retting with aeration. (A process of reusing an industrial waste water.) PB 96 089. 1948. *Bibl. Sci. Ind. Reports 11,* 406 (May 1949). 146 p. tables, diagrs. Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. Price: $1.00.

Jute industry in Germany during the period 1939-1945. British Jute Trade Res. Assn. 1949. PB 96 636. *Bibl. Sci. Ind. Reports 11,* 393 (May 1949). 24 p. table. Microfilm $2.00; Photostat $3.75.

Kenaf. Hibiscus Cannabinus. I-II. R. H. Kirby. *Fibres 10,* 336-38 (1949); 365-66, 369 (Oct. 1949).

Part I—The cultivation of Kenaf is discussed in detail. The necessary climatic conditions, soil conditions, and proper methods of cultivation are noted. Also mentioned are the time of planting, the fertilizers used, methods of harvesting, and the yields which can be expected. This plant, which is being suggested as a jute substitute, is now being grown in India and South Africa successfully. Part II—The processing of this new fiber and the methods of extracting the fibers and retting are discussed. Preliminary investigations have shown that retting is more satisfactory for fiber extraction than is decortication. Several methods of retting are employed. In some cases stagnant water is used, in others slow or fast moving streams.

Machine for decorticating fiber-bearing stalks and leaves. D. E. Patterson. USP 2 480 602, Aug. 30, 1949.

A machine for decorticating fiber-bearing stalks or leaves comprises a pair of rotating, rearwardly abrading beater elements; a pair of rotating, forwardly abrading, beater elements; and means to lengthwise feed the stalks or leaves simultaneously both transversely and longitudinally into engagement by the elements, so that the stalks or leaves first have their opposite ends abraded in opposite directions after which their entire length is subjected to the forwardly abrading elements.

Production and characteristics of the world's cotton crops. Part III. Sudan. E. Lord. *J. Textile Inst. (Trans.) 40,* T527-89 (Sept. 1949).

This paper provides a general but comprehensive account of cotton and its growth in Sudan. A full description is given of the Sudan Sakel and Sudan American cottons, and many details regarding other strains as yet in experimental stages are also given. Also included is such information as agricultural conditions, incidence of disease, and insect pests.

Ramie. B. B. Robinson. PB 95 655. Sept. 1948. *Bibl. of Technical Reports 12,* 26 (July 1949). 7 p. tables. Microfilm $1.25; Photostat $1.25. Limited supply mimeo, 25¢.

Ramie industry. A. J. Hermano. PB 97 859. Sept. 1948. *Bibl. of Technical Reports 12,* 60 (Aug. 1949). 10 p. Microfilm $1.25; Photostat $1.25.

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Ramie industry. Van Vreeswyk. PB 97 869. Jan. 1949. *Bibl. of Technical Reports 12,* 61 (Aug. 1949). 15 p. tables. Microfilm $1.75; Photostat $2.50.

Ramie production in Florida—Progress report. U. S. Bur. of Plant Industry, Soils and Agricultural Eng. & Florida Agri. Experiment Stations, Everglades Branch Station, Belle Glade, Fla. PB 97 342. Nov. 1948. *Bibl. of Technical Reports 12,* 27 (July 1949). 184 p. photos, drawings, graphs, tables. Mimeo, $5.00.

The results of recent studies of ramie culture in Florida and of the processing and testing of the fibers of this plant with the view of improving their availability and quality for use by textile industries and others are outlined in this report which summarizes work done by the University of Florida in cooperation with the Dept. of Agriculture under a research contract with the Office of Technical Services. It describes ideal ramie cultivation practices for the Florida Everglades area including harvesting techniques, degumming and decortication methods, and equipment, the quality and properties of ramie fiber, and ramie leaf meal byproducts for cattle feeding. Ramie has been found highly useful, because of its superior strength and resistance to deterioration for a variety of industrial applications, such as cordage and packing. In addition, it possesses unusual properties for use in dress fabrics. (OTS IRRD Proj Contract Cac-47-6.)

Structure of textile fibers. VII—Structure of flax. A. J. Turner. *J. Textile Inst. (Proc.) 40,* P857-68 (Sept. 1949).

Flax, which is the bast fiber of the flax plant, has as its chief chemical constituent cellulose which is chemically similar to cotton cellulose and has the same characteristic reactions in regards to (a) esterification, (b) ionization, (c) hydrogen bonding, and (d) oxidation. However, flax differs from cotton the following 3 ways: (1) the morphological structure of flax is entirely different from that of cotton, (2) the fine structure is somewhat different than that of cotton, and (3) the chemical composition of the flax fiber is very different from that of cotton.

Artificial fibers A 2

Acrylonitrile and fiber synthesis. A. J. Hall. *Brit. Rayon & Silk J. 26,* 71-2, 85 (Sept. 1949).

Acrylonitrile's most important use at the present time is in the manufacture of Orlon and Vinyon N. It is substituted for vinyl acetate as a co-

polymer for making Vinyon N. Vinyon N has a higher softening point which makes for easier dyeing and finishing operations. Solutions of polyacrylonitrile in dimethylformamide are dry spun into Orlon with high melting and softening points. Acrylonitrile has the property of combining additively with a hydroxyl-containing substance such as cellulose to form a cyanoethyl ether, which can be hydrolyzed into a carboxyl group that may be useful for making sizes or special artificial fibers. The above and other principle applications of acrylonitrile are discussed in detail.

Apparatus for preparing fiber products. Robert A. Smith (to Am. Viscose Corp.). USP 2 481 048, Sept. 6, 1949.

Apparatus for converting a continuous aggregate of filaments of indefinite length into a staple fiber product comprises 2 opposed electrodes and means for continuously feeding the aggregate as a band of generally parallelized filaments between the electrodes. One of the electrodes is stationary and extends across the path of the band, and the other is mounted movably in a direction parallel to the stationary electrode. Means are provided for impressing a high potential electric current across the electrodes, and means for reciprocating the movable electrode.

Development in rayons and synthetic fibers. Anon. *Silk & Rayon 23,* 1064-72 (Aug. 1949).

Recent developments in rayon and synthetic fibers as gleaned from the current textile and patent literature are summarized. A method of producing alkali-resistant alginate fibers by cross-linking with a di-epoxy compounds such as hexylene dioxide is described. Details are given of the new high speed process for ripening cellulose acetate carried out at a temperature between 180°C and 185°C, which eliminates the necessity for subsequent stabilization. Also of interest is the recent success achieved in producing a polymer related to nylon by using the dicarboxylic acid-oxalic acid, instead of adipic acid in combination with a polyamine. The most suitable polymers of this type are made by reacting the ethyl ester of oxalic acid with 1:16-diamino-7:10 diazohexadecane.

Evolution of polyamides for new synthetic fibers. A. J. Hall. *Silk & Rayon 23,* 1218, 1220, 1222, 1225 (Sept. 1949).

Entirely new linear polyamides can be produced from components which contain more than 2 amide-forming groups, if the reactive groups present, in addition to the 2 necessary for polyamide

formation in the ordinary way, are present in special positions in the component molecules, and if the condensation process is carried out in liquid phase. With further research it is hoped ultimately to enable superior nylon-like synthetic fibers to be made from them.

Fibers. Robt. S. Casey & C. G. Grove, Jr. *Ind. Eng. Chemistry 41*, 2119-21 (Oct. 1949).

This is a review of the properties and applications of rayon and synthetic fibers. 107 references.

THE FIBRO MANUAL; a treatise on the characteristics and application of viscose rayon staple produced by Courtaulds, Ltd. By a group of specialists under the editorship of C. M. Whittaker. London, Slyvan Press, [1949]. 312 p. Price 21s.

. . . After a brief historical introduction there is a short chapter telling how rayon staple is made and a further chapter dealing with physical and chemical properties in some detail. Section II.—Spinning—includes chapters on the "Greenfield Top" and tow to top conversion and the 7 systems of spinning staple on the old-established types of spinning machinery. Section III—Fabric Production—contains chapters on fabric construction, warp sizing, weaving and knitted fabrics and in the appendix are construction details of 20 typical fabrics made from "Fibro". As might be expected the final section—Preparing, Dyeing, Printing, and Finishing—is by far the largest section and includes chapters on staple and yarn dyeing, narrow fabric dyeing, preparing and dyeing of Fibro fabrics, printing, finishing and preparing and dyeing of Fibro/wool, Fibro/Rayolanda, Fibro/Fibroceta and Fibro/Fibrolane blends. The Laundering of Fabrics Made with Fibro, contributed by the British Launderers' Research Association, and The Fastness of Spun Dyed Fibro shades appear in the Appendices. . . . —*Silk & Rayon.*

Highly polymeric linear esters. Jas. G. Cook, Jas. T. Dickson Arthur R. Lowe, & John R. Whinfield (to Imperial Chemical Industries Ltd.). USP 2 471 023, May 24, 1949.

A process for the manufacture of highly polymeric linear esters comprises heating the β-hydroxyethyl ester of P-(hydroxymethyl)-benzoic acid. The heating is effected in a stream of an oxygen-free gas under conditions where, at least during the last stages of the reaction, volatile by-products are removed. The heating is continued until filaments formed from a melt of the product can be

permanently extended by cold-drawing into useful fibers.

Man-made fibers. G. S. Kashekar. *Indian Textile J. 59*, 965-74 (Aug. 1949).

Man-made fibers such as rayon, nylon, Vinyon, Saran, Velon, polyethylenes, glass, metallic, and protein base fibers are discussed in detail. A brief history is given of each fiber, the quantities produced noted, and the chemical and physical properties and methods of identifying the various fibers discussed.

Manufacture of improved fibrous materials and the materials thus obtained. Ludwig Orthner, Gerhard Balle, Heinz Schild, Max-Otto Schurmann, Karl Brodersen & Matthias Quaevlieg (to Attorney Gen. of U. S.). USP 2 471 039, May 24, 1949.

Cellulose fibrous materials distinguished by a soft and agreeable feel may be improved by incorporating with the aqueous cellulose spinning solution colloidal alkali compounds of a sulfonic acid amide obtained by the simultaneous action of chlorine and sulfur dioxide on a mixture of saturated aliphatic hydrocarbons having at least 8 C atoms. A subsequent reaction with a substance selected from the class of ammonia and primary amines follows. The sulfonic acid amides are insoluble in alkali carbonates and are uniformly subdivided in the interior of the fiber.

Newer synthetics are in the spotlight. C. W. Bendigo. *Textile World 99*, 111-30 (large folded insert) (Sept. 1949).

Textile World's 1949 synthetic fiber chart includes tables showing the chemical and physical properties, x-ray diffraction diagrams, microscopic cross-section photographs, stress-strain curves, and sources and sizes of commercial synthetic yarns and fibers, a few of which will not be available in great quantities for some months yet. There are also numerous tables showing production, consumption, and prices of these fibers as compared to wool and cotton.

Spun dyed "Fibro"—application and uses. Robt. S. Greenwood. *Can. Textile J. 66*, 46-9 (Sept. 30, 1949).

Spun dyed "Fibro", which is rayon staple colored by means of pigments added to the viscose dope, is now produced commercially by Courtaulds, Ltd. in 10 shades of good color fastness. Six of the shades will withstand combined soda boiling (open kier) and hypochlorite bleach. Four of the shades are suitable for cross-dyeing or

over-printing with vat dyes. By combining staples of different shades a wide range of colors may be obtained. The pigments in spun dyed fibers exert a protective effect against the actinic rays of the sun as evidenced by the small increase in cuprammonium fluidity of samples exposed for 450 sunhours.

Synthetic fibers. Anon. *Chem. Eng. News 27*, 2092 (July 18, 1949).

A brief note describes 2 new synthetic fibers which have been produced experimentally at the Southern Regional Research Lab., New Orleans, La. Cottonseed protein is used to make a fiber which is three-fourths as strong as wool when dry, and which has a soft hand and good dyeing characteristics; wet strength is about 40% of the dry. The fiber has a natural color of yellow or light orange. The other fiber is spun from sodium carboxymethylcellulose and will dissolve in soapy water or other weak alkali solutions, which makes it useful as a supporting fiber in the weaving of novel fabrics. The fiber has a dry strength about equal to that of wool.

Thread advancing reel. Richard W. Stanley (to Am. Viscose Corp.). USP 2 461 575, Feb. 15, 1949.

This invention is a continuation of USP 2 396 297 (TTD: *3*, 224), USP 2 403 031 (TTD: *3*, 367), USP 2 419 605 (TTD: *4*, 210) and USP 2 447 143 (TTD: *5*, 644). A sealing partition is provided between the bars with or without immediately adjoining supporting structure on the one hand and the operating mechanism on the other hand. Cooperating with the sealing partition to protect the working parts, there is provided at least 1 plate arranged to substantially close off the end plate enclosing the free end of a cantilever reel, a sealed bore is centrally disposed of the end plates to permit the projection of a driving shaft or retaining coupling member. This construction of reel is well adapted for use in operations involving the applications of liquids, even of corrosive character, to threads carried in a helical path over the bars thereof.

Thread guide holder. Jos. H. Barnes (to Delaware Rayon Co.). USP 2 451 795, Oct. 19, 1948.

A thread guide holder for rayon spinning machines comprises a bracket having an apertured cylindrical portion with a pin fitting in the aperture. An eccentrically apertured offset cylindrical portion of the bracket is provided for receiving the end of a thread guide. Lock nuts rotatably engage the cylindrical portions of the bracket and

pin and have eccentric apertures so that when rotated to different positions they will serve to frictionally grip or release the pin or the thread guide.

Trends in rayon yarn production methods I. J. L. Coster. *Silk & Rayon 23*, 1129-30, 1132 (Sept. 1949).

Basic methods of viscose rayon production are reviewed, and possibilities for modification in the future are discussed. Processing and production costs are also reviewed as to the trends of equipment and process for the future.

YARN PRODUCTION B

Cotton mill practices. Anon. *Am. Wool Cotton Reptr. 63*, 9, 20 (Nov. 3, 1949).

Answers to questions on the use of Texas cotton, amount of reworkable waste, cleaning methods, maintenance, etc. which were discussed at the fall meeting of the Western North Carolina-Virginia division of the STA are reported.

Fancy yarns. IX, Parts II-IV. A. T .C. Robinson. *Fibres 10*, 199-201 (June 1949); 275-76 (Aug. 1949); 325-28 (Sept. 1949).

Part II—A fancy yarn ring twister and doubler is discussed. This twister and doubler is primarily intended for the production of woolen and worsted fancy yarns, but can be used for other types of yarns as well, by making use of 3 lines of independently controlled rollers. Such yarns as gimps, boucles, spots and cover yarns in one or more colors can be produced on this equipment. Part III—A fancy yarn doubler with 3 lines of independently controlled rollers is described. Two of the lines are on one level and the third on a higher level permitting more direct passage of the yarn from the nip of the back rollers. Each line of rollers has its own pattern chain through which the roller actuating mechanism is operated, thus providing for variable spacing of intermittent effects. The machine is therefore capable of making a wide range of non-patterning yarns. Part IV—This is a discussion of a fancy yarn doubler operating on the ring principle which will wind either parallel-built bobbins or cops; alternative mechanisms for controlling the rollers so as to provide a full range of fancy yarns are noted.

Irrigated cotton. Anon. *Textile Industries 113*, 104-6, 186, 207, 209 (Nov. 1949).

The characteristics and some of the disadvantages in using irrigated cotton are reviewed. A survey is presented of the manufacturing methods used

in opening, carding, drawing, and other processing of irrigated cotton in 3 different groups of textile mills.

Reduction of the worsted open drawing process. P. P. Townsend & M. J. Rzegocinski. *J. Textile Inst. (Trans.) 40,* T656-69 (Sept. 1949).

An investigation was made of the possibilities of utilizing the sliver from a Noble comb as raw material for the drawing process. It was found that the use of such a thin sliver permits the omission of the majority of the open drawing processes. Examination of the resultant yarns showed that they compare favorably with those produced from the same wool (64s) by the normally accepted top finishing and drawing processes, from the point of long and short term irregularity and yarn strength.

Removal of waste yarn from bobbins and the like. Robert Wade (to Am. Enka Corp.). USP 2 482 854, Sept. 27, 1949.

A system for removal of waste yarn from bobbins involving axial motion of the bobbin over a knife.

Spun silk production. R. C. Ford. *J. Textile Inst. (Proc.) 40,* 904-06 (Sept. 1949).

The processes for making spun silk from the raising of the silk worm to the weaving of the fabric are described. The processes after the silk is obtained are as follows: degumming, combing or dressing, spreading, lapping, drawing, spinning, doubling, gassing, reeling, cleaning, cheesing, warping, weaving or knitting.

Fiber preparation B 1

Machine for processing waste fibers. Charlie W. Barnes & John W. Cole (to Gastonia Textile Machinery Co.). USP 2 484 604, Oct. 11, 1949.

This invention provides a waste machine for textile fibers having the usual beater for shredding the waste and also having a driven cylindrical screen with an imperforate cover against which the shredded waste is blown, through the action of the beater, and having a driven cylindrical perforated drum disposed on the opposite side thereof from the beater, which permits the blast of air from the beater to pass through the cylindrical screen and outwardly through the perforations in the perforated drum. The cylindrical screen, in cooperation with the perforated drum communicates with atmospheric pressure to settle the fibers as well as assisting in the laying of the fibers in web form on conveying means associated

therewith. This machine is capable of handling all kinds of waste textile fibers, such as rovings removed from left-over bunches on skewers, the better fibers after being processed being adapted to be mixed with longer staple fibers in a picking operation and thus reclaimed for re-use.

New patented bitter-roller stand for rag machines. N. C. Gee. *Textile Mfr. 75,* 423 (Sept. 1949).

Of interest to shoddy manufacturers and flock makers are the new brackets which have been designed to accommodate the bitter-roller, the feed rollers and the front server feed-roller of rag machines. Provisions are made for lateral adjustment of the brackets and independent adjustment of the bitter-roller by threaded bolts and winged nuts. A double lever arrangement is provided to apply pressure to the feed rollers.

Simultaneously scouring and bleaching wool. Archie L. Dubeau (to Mathieson Chemical Corp.). USP 2 481 205, Sept. 6, 1949.

A continuous process for simultaneously scouring and bleaching wool comprises continuously passing the wool in contact with an aqueous liquor containing soda ash, sodium bicarbonate, soap and sodium chlorite and maintaining the composition of the liquor such that the weight ratio of apparent carbonate to bicarbonate is within the range of 1:0.5 to 1:2 substantially throughout the operation.

Carding and combing B 2

Card clothing confusion can easily be cleared up. Gustav Zellnik. *Textile World 99,* 151, 216, 222 (Sept. 1949).

The differences in American and Continental wool card clothing numbers are cleared up by a table. The U. S. and Continental points per sq. in. are also given in a table. Other differences are discussed, such as pitch, height of wire staple, foundations, and the type of wire used. A diagram shows the row or rib, twill and plain settings of card-clothing wire.

Combing machine for combing textile fibers. Donald Pierrepont (to Platt Brothers and Co.). USP 2 483 931, Oct. 4, 1949.

According to this invention, an improved apparatus for setting the nippers of Nasmith combing machines includes an easily accessible graduated setting arm located at approximately mid-position in the length of the combing machine and in operative connection with the nipper setting

shaft, the arm being adapted for adjustment in a guide in the machine frame by means of a manually operable screw-threaded rod whereby to transmit turning movement to the nipper shaft and with a minimum of torque on the shaft, the setting arm being furnished with an easily visible index gauge to indicate the precise setting of the nippers.

Good carding requires precise settings. Anon. *Textile World 99,* 159, 161, 226, 228, 230 (Sept. 1949).

Frequent and close inspections of the lickerin should be made; recommended card-wire numbers for cylinder, doffer, and flats are given in a table; inspection and care of cylinders, flats, and doffer are described; how to take nep counts and what to look for when neps are excessive are discussed; tables of typical card settings, rates of production, and common carding defects are included.

Roller feeding apparatus for feeding slivers to carding engines and the like. Irvin Marsden & Lewis Collins (to Platt Brothers & Co., Ltd.). USP 2 480 491, Aug. 30, 1949.

A stop motion for the rollers of a roller feeding apparatus for feeding fibrous material in sliver-like form to carding engines and the like comprises a driving connection to the rollers and mechanism for disengaging the driving connection to the rollers, operable by a predetermined excess resistance to the rotation of the rollers for the feeding of the sliver, as may be caused by the building-up of the sliver on the rollers.

Woolen card lubrication. Wm. J. Crofts. *Textile Industries 113,* 107-10 (Nov. 1949).

Woolen card lubrication is discussed with details of the organization for oiling, instructing oilers, and oiling bearings and comb boxes. Lost time, costly repair jobs, and damaged output can be reduced by careful attention to lubrication.

Woolen carding. Anon. *Textile Mfr. 75,* 434-37 (Sept. 1949).

Intermediate feeding mechanisms are the devices used to strip material from the first part of a carding set, transport it across the intervening space and present it in an even and regular form to the subsequent part of the set. A detailed description is given of various intermediate feeding mechanisms, including the Blamire feed, Scotch feed, straight fiber broad band feed, and others.

Drafting and roving B 3

Ambler super-draft system; invention for high speed drafting in the worsted drawing process. N. Lancaster, Jr. & C. V. Dermott. PB 97 986. June 1949, 7 p. *Bibl. of Technical Reports 12,* 101 (Sept. 1949). Microfilm $1.25; Photostat $1.25. U. S. Consulate, Bradford, England, Unclassified Report No. 38.

Spinning B 4

Antimarriage roller. C. H. Harrigan (to John H. Hays). USP 2 481 998, Sept. 13, 1949.

An anti-marriage device for preventing entanglement of adjacent strands of roving in spinning machines comprises a pair of rollers with one of the rollers mounted for movement bodily away from and toward the other roller. Means are provided to rotate the rollers when they are in contact with one another. One of the rollers has a plurality of annular grooves spaced along its length, and the grooves and the other roller together form passageways through which strands of roving may pass.

Appliance for removing dust from spinning frames by means of compressed air. Mechanische Baumwolle-Spinnerei & Weberei. PB 74 390t18. May 1948. *Bibl. Sci. Ind. Report 11,* 453 (May 1949). 8 p. drawings. Available from Research Information Service, 509 5th Ave., New York 17, N. Y. Price $7.00.

Appliance for retrieving broken pieces of roving at the end rolls of spinning frames. Mechanische Baumwolle-Spinnerei & Weberei. PB 74 390t19. May 1948. *Bibl. Sci. Ind. Report 11,* 453 (May 1949). 9 p. drawings. Available from Research Information Service, 509 5th Ave., New York 17, N. Y. Price $10.00.

Brake means for textile mill spindles. Columbus R. Sacchini (to Marquette Metal Products Co.). USP 2 481 043, Sept. 6, 1949.

In a textile mill spindle having a bobbin-supporting blade and whorl unit with a circular braking surface, a brake means cooperates with the surface and means normally hold the brake means in released or non-braking condition. Brake actuating means comprising an overcenter toggle mechanism include a single compression spring arranged to hold the toggle mechanism in overcenter latched condition while simultaneously acting as a yielding push rod to exert braking pressure on the brake means, so that the blade and

whorl unit can be retained against movement without requiring attention of an operator during doffing of the bobbin.

Device for doffing cops from spindles of ring spinning frames and ring twisters and for replacing the tubes. Wilhelm Fischer. PB 74 390t27. Apr. 1948. *Bibl. Sci. Ind. Report 11*, 452. (May 1949). 14 p. drawings. Available from Research Information Service 509 5th Ave., New York 17, N. Y. Price $17.50.

Flier construction. Michael J. McHale. USP 2 483 320, Sept. 27, 1949.

In a flier for spinning machines and the like, a central apertured body member having base and head portions, a peripheral flier wire support member formed on the body between the base and the head portions, a flier wire support adapted to seat on the peripheral member, the support having a central opening adapted to receive the head portion of the body member, and means integral with the flier wire support contiguous to the central opening and frictionally engaging the flier body when the flier wire support is seated on the peripheral member, whereby the flier wire support is securely clamped to the flier body.

Flier construction. Michael J. McHale. USP 2 483 321, Sept. 27, 1949.

A balanced unitary molded plastic flier block comprising a centrally apertured body member having an off-set foot adapted for insertion into the head of a bobbin, and a peripheral flange on the body member having an enlarged portion in a direction opposite the foot, whereby to balance centrifugal forces generated by the foot when the block is rotated.

Hard waste control. John L. Beacon. *Textile Age 13*, 22, 26, 30-1 (Oct. 1949).

Practical means for eliminating unnecessary hard waste produced in the spinning room at the frames and doffers are described.

Knitted nylon fabric waste successfully spun with wool. Anon. *Am. Wool Cotton Reptr. 63*, 87, 89, 91, 93-4 (Oct. 20, 1949).

Details of experiments on the spinning of waste from the knitting of nylon stockings with wool are discussed. Results show that the blending of 10 to 20% nylon shoddy with wool gives greater strength in the spun yarn, longer wearing properties in the fabric, shrinkage slightly reduced, and preserved cloth strength even after a vigorous rubbing trial. The blend may be spun on the cotton, woolen and worsted system.

Process and appliance for preparing weaving and knitting yarns from rayon staple fibers. I. G. Farbenindustrie A. G. PB 34 243t. Dec. 1948. *Bibl. Sci. Ind. Reports 11*, 453 (May 1949). 5 p. Available from Research Information Service, 509 5th Ave., New York 17, N. Y. Price $7.50.

Process and appliance for spinning long and short slivers simultaneously. Hermann Kluftinger. PB 74 390t16. May 1948. *Bibl. Sci. Ind. Reports 11*, 453 (May 1949). 9 p. drawings. Available from Research Information Service, 509 5th Ave., New York 17, N. Y. Price $9.50.

Rail supporting means for spinning machines. E. Kinsella (to Celanese Corp. of Am.). USP 2 480 219, Aug. 30, 1949.

A ring spinning machine for the collection of a series of yarns comprises a series of vertical spindles, a horizontal lifter rail adapted to be vertically reciprocated and to traverse the yarns upon bobbins mounted on the spindles. A plurality of vertical poker rods carry and actuate the lifter rail, and guide means embrace each poker rod along a substantial length of it. The poker rods are adapted to slide through the guide means and are disposed in pairs along the length of the lifter rail. The rods of each pair are at the same distance along the length of the rail, one being attached rigidly near one edge of the lifter rail and the other attached flexibly near the other edge.

Single-stage process for wet spinning and drying of yarn. Wilhelm Hoppe. PB 74 390t15. May 1949. 6 p. drawings. Available from Research Information Service, 509 5th Ave., New York 17, N. Y. Price $4.50.

Slub yarn apparatus drive. John G. Kershaw (to Dominion Textile Co., Ltd.). USP 2 480 936, Sept. 6, 1949.

A slub motion apparatus adapted for use on a spinning frame having companion pairs of driven front and back rolls, one pair at each side of the frame includes a cam mounted for rotation with means for rotating the cam, a pivotally mounted pawl lever, a first clutch at one side of the machine, a second clutch at the other side of the machine, an elongated connecting rod extending across the machine and rotatably mounted on its longitudinal axis. The rod has a yoke at one end with the other end being formed to provide for rotary leverage. The rod upon being actuated by the pawl lever is adapted to rotate and urge the second clutch into engagement simultaneously and in the same direction as the first clutch.

Slubbing device. Geo. W. Byers (to Am. Viscose Corp.). USP 2 472 283, June 7, 1949.

A slubbing device which may be readily attached to a spinning or roving machine and will form yarns. rovings, etc. having irregular counts is claimed. In a drafting mechanism, a set of restraining rolls and a set of drawing rolls are provided with means for driving both sets of rolls, the drawing rolls at a higher rate of linear speed than the restraining rolls. The slubbing device is positioned between the drawing rolls and restraining rolls and comprises an element disposed for engaging a strand passing between both sets of rollers. Means for oscillating the element varies the path of the strand between the drawing rolls and the restraining rolls.

Spinning frame regulator. W. E. Blatz. *Melliand Textilber. 30,* 95-8 (1949).

This is a description of a new spinning frame regulator which effects (1) a periodic fluctuation of spindle speed, (2) changes in the magnitude of the speed, and (3) adjustment of the height of the spindle. Circuit and lay-out diagrams are given.

Spinning machine for improved spinning of short and long fibers which saves considerable manual work. C. F. Solbrig Söhne A. G. PB 74 390t24. June 1948. *Bibl. Sci. Ind. Report 11,* 453 (May 1949). 30 p. Available from Research Information Service, 509 5th Ave., New York 17, N. Y. Price $31.50.

Thread guide for wet spinning frames. G. S. Schachne. PB 74 390t17. Apr. 1948. *Bibl. Sci. Ind. Report 11,* 453 (May 1949). 5 p. drawings. Available from Research Information Service, 509 5th Ave., New York 17, N. Y. Price $3.50.

Twisting machinery improvements help solve knitting problems. W. A. B. Davidson. *Rayon & Syn. Textiles 30,* 68-9 (Oct. 1949).

The growth in use of synthetic fibers is causing a revision of manufacturing techniques. Twisting equipment is becoming very important to producers of synthetic yarns. Two new twists for 10-denier nylon yarn, a crepe and a compensene, are discussed.

Winding and spooling B 5

Automatic winding of small yarn packages. Tech. Representative. *Brit. Rayon & Silk J. 26,* 66-7, 83 (Sept. 1949); *Textile World 99,* 168-70 (Sept. 1949).

Muschamp Taylor Ltd. has introduced a line of automatic winders for winding taper end quills for smallwares shuttles, straight end spools for sewing machines, or small flanged bobbins for braider carriers. Manual work is needed only for repairing broken ends, replenishing supply packages and refilling magazines with tubes or bobbins. The machines have a mechanism for measuring the length of yarn wound on each package. Spindle speeds up to 3,500 rpm for quills and spools or 5,000 rpm for parallel wound bobbins are possible.

Bobbin building motion. Hilmar Roessel (to Fletcher Works, Inc.). USP 2 481 619, Sept. 13, 1949.

A bobbin building motion for a yarn winding machine, having a bobbin driving drum and a uniformly reciprocable yarn guide operable parallel to the axis of it, is claimed. The motion comprises a fixed bracket adjacent the drum, a shaft rockable and axially slidable in the bracket, a lever fixed to the shaft, a yoke on one end of the lever for maintaining a bobbin in peripheral rolling contact with the drum, a cam roller rotatably mounted on the opposite end of the lever, and a cam fixed on the bracket and engagable by the roller to shift the bobbin axially as it increases in diameter to form a frustoconical end on the bobbin.

Double twist spindle. John K. Cochran (to Duplan Corp.). USP 2 484 016, Oct. 11, 1949.

This invention provides a double twist spindle for textile yarns having a shank portion having an internal longitudinal passage and a transverse hole therein and a smooth finished elongated pin supported in the transverse hole and having the side thereof projecting into the internal passage.

Feed roll unit for textile machines. Albert E. Winslow (to Universal Winding Co.). USP 2 481 185, Sept. 6, 1949.

A feed unit for advancing yarn to the take-up package of a textile machine, comprising a spindle for a take-up package, and particularly designed for use on twisting machines is claimed. The unit comprises a rotatable feed roller, a drive shaft with a pulley on the shaft, a pulley connected to the feed roller, a flexible member extending about the pulley for transmitting motion from the drive shaft to the feed roller, a mechanism for moving the member to and from driving engagement with the pulleys, and a trip mechanism operable upon the breaking of a yarn for actuating the mechanism.

Tweedales introduce new ring doubling frame. Anon. *Silk & Rayon 23*, 1092 (Aug. 1949).

A new ring doubling frame has been introduced which is specifically designed to meet present-day trends in the preparation of rayon and nylon yarns. The doubler is designed for ring diameters up to 5½ in., gauges up to 7 in. and up to 8-in. lift bobbins. It may be arranged for either dry doubling or with troughs for English system wet doubling.

Yarn package support. James S. Dix. USP 2 483 490, Oct. 4, 1949.

A device is provided to support one conical yarn package on top of another, wherein each yarn package consists of a hollow conical core having a body of yarn wound thereon so that the upper end of each body of yarn has a substantially segmental spherical concavity into which the upper end of the associated core projects.

Yarn processing B 6

Apparatus for drying filaments. Dwight K. Alpern, Herman M. Freydberg & Wm. H. Hawkins (to Freydberg Bros.-Strauss, Inc.). USP 2 483 378, Sept. 27, 1948.

An apparatus for drying coated thread, wire, or cord comprises a series of closed vertical drying chambers, exhaust compartments positioned between the drying chambers and forming with them a bank of drying chambers and exhaust compartments, means for moving threads vertically in each of the drying chambers, and an intake compartment. A wall between each of the chambers and the intake compartment has a series of intake openings vertically and horizontally spaced for the admission of air streams into the chambers against the threads transversely to the movement of threads in the chambers. At least one side wall of each of the chambers separates it from an exhaust compartment having a series of exhaust openings vertically and horizontally spaced for the withdrawal of air streams from the chambers into the exhaust compartments transversely to the movement of threads in the chambers.

Coating threads. J. A. Lodge. Australian P. 133 889, Aug. 14, 1946.

For simultaneous treatment a plurality of threads in spaced parallel relationship are drawn through a suitable coating device, then between a pair of spaced clearer rollers which are rotated contrawise to the direction of travel of the threads,

through a heated drying device and finally to rewinders. A peripherally grooved applicator roll dips into a trough of coating material which rotates in a direction contrary to the travel of the threads, and a pair of clearer rollers which rotate contrary to the direction of thread travel, may have their surfaces covered with fabric or bristles, and are preferably adjustably mounted on shafts to facilitate their spacing in accordance with the size of the threads and the thickness of the coating desired.

Device for catching broken threads. Chas. Caille (to Sulzer Freres S. A.). USP 2 481 197, Sept. 6, 1949.

A filament catching device, for catching up the oncoming part of a normally taut running filament after abnormal breaking, comprises a blast opening directed towards the running filament for producing a continuous gaseous jet traversing the path of the filament and a catching device arranged beyond the path opposite the opening.

Knitting yarn preparation must reflect quality. E. Dalton White. *Textile World 99*, 108-09, 244, 246 (Sept. 1949).

Responsibility for quality rests with the department supervisor at Richmond Hosiery Mills, Rossville, Ga. The schedules of cleaning, lubrication, and overhauling of the yarn manufacturing equipment, and quality checks are important. Examples of this mill's application of these schedules are given. Sample tables of speeds, roll settings, etc., are included.

New British uptwister. Tech. Representative. *Brit. Rayon & Silk J. 26*, 64-5, 85 (Sept. 1949).

Sydney and E. Scragg Ltd. have introduced an entirely redesigned light package uptwister. This machine, which is described in some detail, can be built to any spacing between spindles and cheek centers, and is designed for spindle speeds up to 15,000 rpm. Ball and roller bearings are used extensively, "Oilite" bearings being used at some points. It also features simplified twist gearing, and metal trays fitted below spindles on both decks.

Special yarns B 7

Appliance for manufacture of effect threads. Gehlert and Soehne. PB 74 390t21. May 1948. *Bibl. Sci. Ind. Report 11*, 452 (May 1949). 13 p. drawings. Available from Research In-

formation Service, 509 5th Ave., New York 17, N. Y. Price $13.75.

Emulsion important on cotton-wool blends. E. H. Helliwell. *Textile World 99*, 163 (Sept. 1949).

Blends using coarser wools are more difficult to make than those using the finer wools. The cotton is processed as usual; the wool is treated with the following formula: S. S. wool oil, 8 gals.; water, 52 gals.; water softener, 20%. Combed wool tops are run through a staple cutter, then a 2-section W-3 waste mixer where oil is sprayed on. The wool stock is then run through the wool cards and one process of drawing. Blending is done on the back of the cotton-process breaker drawing frame. The percentage of wool and cotton is carefully controlled within fairly close tolerances.

New process and appliance for manufacturing multiple-ply yarn. Carl Hamel A. G. PB 74 390t22. May 1948. *Bibl. Sci. Ind. Report 11*, 452 (May 1949). 9 p. drawings. Available from Research Information Service, 509 5th Ave., New York 17, N. Y. Price $12.00.

Process and appliance for manufacturing crepe yarn of rayon filaments of staple fibers. Gehlert & Soehne. PB 74 390t20. May 1948. *Bibl. Sci. Ind. Reports 11*, 452 (May 1949). 11 p. drawings. Available from Research Information Service, 509 5th Ave., New York 17, N. Y. Price $15.00.

Process for manufacturing spirally curled yarns of improved properties from rayon staple. I. G. Farbenindustrie A. G. PB 20 543t8. *Bibl. Sci. Ind. Report 11*, 452 (May 1949). 4 p. Available from Research Information Service, 509 5th Ave., New York 17, N. Y. Price $4.00.

Yarn products B 8

Handknitting faults. Anon. *Fibres 10*, 361-62 (Oct. 1949).

Very few yarns produced are perfect, and handknitting yarns are no exception to this rule. However, a great deal of latitude is permitted in these yarns as compared to fine count worsted yarns for weaving purposes. Certain points are recognized by the ordinary knitter and lead to consumer complaints. These gross faults or defects are as follows: knots, yarn levelness, light weight hanks, cut ends, twisting faults, fading, and shrinkage.

Preparation of elastic polychloroprene threads, bands, etc. Robt. H. Walsh (to E. I. du Pont de Nemours & Co.). USP 2 482 889, Sept. 27, 1949.

A polychloroprene latex particularly adapted for use in the preparation of elastic polychloroprene thread, bands and sheets, having incorporated therein from 1% to 4%, based on the polychloroprene present in the latex, of a sulfurized monocyclic terpene hydrocarbon containing from 24% to 36% of combined sulfur.

Ropemaking machine. Thomas E. Lee. USP 2 484 303, Oct. 11, 1949.

This invention provides an improved rope making machine of the type especially adapted for making rope out of waste singlings and short ends of yarn. Three strands or more of such yarn are twisted about their respective axes, and the twisted strands are wound about a central core. The resulting rope will prove to have substantial strength and may in many cases be substituted for the rope made of conventional and longer material.

Spindle for braiding looms. Nazaire Philippon (to Filature & Tressage Vanham S. A.). USP 2 481 237, Sept. 6, 1949.

A spindle for a braiding loom comprises a foot having an upper plate, a central bobbin-carrying post extending upwards from the foot, a rockable body mounted immediately above the upper plate of the foot with one end of the rockable body weighted so that it normally rests on the upper plate of the foot and the other end normally raised. The rockable body is capable, when rocked out of this normal position, of causing the stoppage of the loom. A thread-tensioning element is adapted to be supported by thread passing from the bobbin, and a lateral post extends upwards from one side of the foot adjacent the rocking body. The lateral post serves as a guiding means for causing the thread tensioning element, in the event of breakage of the thread or exhaustion of the bobbin, to fall on to the raised arm of the rockable body and to rock the body.

FABRIC PRODUCTION C

Yarn preparation C 1

Colourless, water-soluble textile sizing agents, based on polyvinyl compounds. I. G. Farbenindustrie A. G. PB 95 600. 1940. Frames 5003-5009. *Bibl. Sci. Ind. Report 11*, 516 (June 1949). Enlargement print $2.50; *in German.*

High speed drawing-in with any draft. Tech.

Representative. *Brit. Rayon & Silk J. 26,* 69, 70 (Sept. 1949).

The "Titan" Automatic Heald Indicator is a device for indicating to the operator the proper shaft or harness the next end is to be drawn in through, regardless of how complex the pattern is (up to 34 harness). This relieves the operator of having to refer to the pattern draft. The device consists of a punched paper pattern roll and a glass rod between each harness. The glass rod is so lighted that it will glow red at the top when that harness is indicated.

High speed silk and rayon warping creel. Anon. *Textile Mfr. 75,* 432-33 (Sept. 1949).

A new jack creel designed by Henry Livesey Ltd. incorporates several distinctive features, including individual thread adjustment, a patent cone-gripping device, and a mercury stop motion.

Method of making warp beam head clamp pads. Carl P. Bergstrom (to Crompton & Knowles Loom Works). USP 2 480 214, Aug. 30, 1949.

The method of making a beam head for a warp beam having a barrel for use on looms consists of forming the head with a hub and flange integral with it having an open space across which extends a pad integral with the hub, boring the hub and pad to provide a bearing surface to fit the barrel so that the bearing surface of the pad will be concentric with the bearing surface of the hub. The pad is then separated from the hub and beam head by cuts extending from the interior of the hub into the open space, and the pad is mounted on the beam so that the bored surface of the pad will be concentric with the bored hub.

New high speed creel. Anon. *Silk & Rayon 23,* 1202, 1204 (Sept. 1949).

Features of a new standard type of Jack creel are described, and the creel itself, is illustrated.

Processing of starch pastes. Bruce De Haven Miller (to Girdler Corp.). USP 2 481 436, Sept. 6, 1949.

A process for preparing starch pastes comprises mixing starch with water to form a slurry, continuously feeding the slurry in a thin confined layer under positive pressure endwise to and through an elongated heating zone having a heat transfer wall, and gelatinizing the slurry in the zone by supplementarily agitating and indirectly heating the slurry through the wall. The resultant paste is then continuously discharged from the heating zone and continuously fed to a cooling zone where it is cooled to a temperature below

effective starch cooking temperature. The cooling is effected at a rate sufficient to maintain that state of gelatinization obtained in the heating zone.

Swiss slashing practices. Paul V. Seydel. *Textile Industries 113,* 117-18, 121, 123 (Nov. 1949).

Slashing methods in Switzerland which differ from American procedure are described. Included in the discussion are Swiss slashers, size cooking and storage, use of burlap for threading slasher, etc.

Use of polymers as sizing agents for synthetic fibers or yarns. I. G. Farbenindustrie A. G. PB 25 616t8. Dec. 1948. *Bibl. of Technical Reports 12,* 60 (Aug. 1949). 2 p. Micro FIAT Patents 172, Frames 1411, trans. Available from Research Information Service, 509 5th Ave., New York 17, N. Y. Price $2.50.

Weaving C 2

Automatic warp let-off motion; two beam version. Tech. Representative. *Brit. Rayon & Silk J. 26,* 68-83 (Sept. 1949).

A 2-beam model of the positive warp let-off has been introduced. The motion is identical in mechanism with the standard model except that it is driven from cams on the bottom shaft of the loom instead of the sley sword. This motion can be used in conjunction with a single beam let-off or another 2-beam model for multiple beam work of more than 2 beams. This gives the same fabric quality for multiple beam work as that obtainable for single beam fabrics.

Bobbin and method of making same. Richard G. Turner (to Crompton & Knowles Loom Works). USP 2 482 446, Sept. 20, 1949.

A method of making a bobbin for use with the electric weft detecting system of a loom consists in forming a bobbin body with a detecting zone tapering generally from the butt toward the tip of the bobbin and forming steps on the detecting zone which taper toward the butt. The bobbin is then provided with a waterproofing coating; a layer of electric conducting paint is placed on the coating on the detecting zone; and a metal ferrule is electrolytically deposited on the layer of paint.

Cop retainer for loom shuttles. Edward Green (to Moss Rose Mfg. Co.). USP 2 484 380, Oct. 11, 1949.

This invention provides an improved device for maintaining the cop under constant and substan-

tially uniform pressure within the shuttle, so as to insure unwinding of the yarn from the cop and passage thereof from the shuttle at a substantially constant rate by provision of an improved follower, operating by inertia when the motion of the shuttle is suddenly arrested in its passage across the loom, to maintain a constant pressure against the end of the cop and to thereby confine the cop closely in the shuttle until entirely exhausted.

Design and production of figured rayon weaves—I & II. A. T. C. Robinson. *Silk & Rayon 23*, 1058-64 (Aug. 1949); 1191, 1193-94, 1196, 1198 (Sept. 1949).

I—This first article in a series describes methods of applying figured designs to fine pitched machines such as the Vincenzi and Verdol. The French system of condensed designing and lisage cutting is described and illustrated. Detailed instructions are given for preparing a condensed design and gamut and where necessary for painting out in full. The operations of "reading-in" and cutting the cards are explained and a short description is given of the unique Uhlig machine. II—Examples are given of commercial designs produced on standard filament rayon. Detailed descriptions are given of a spot poult and taffeta, imitation lace, brocaded poult, chameleon taffeta, figured lingerie and semi-sheer crepe.

Design and production of plain rayon weaves. 1-4. A. T. C. Robinson. *Silk & Rayon 23*, 518, 520, 522, 524 (Apr. 1949): 653, 656, 658, 660, 662 May 1949); 796, 798, 800, 804, 806 (June 1949); 926, 929, 930, 932, 934 (July 1949).

This is a series of 4 articles dealing with the technical details involved in the design and production of a number of different weaves. The various designs are illustrated by photographs and are discussed individually.

Diggle's chain and Knowle's box motion. W. Middlebrook. *Textile Mfr. 75*, 424-26 (Sept. 1949).

This describes some of the better known British box motions. The Diggle's motion is described as negative since the boxes drop by their own weight and thus is of little use in fast running looms. The chain itself is heavy, costly and cumbersome. The Knowle's motion, which also requires the use of a chain, is normally negative but may be made positive in action by duplication of the chains and pulleys. One set of chains is used for lifting the boxes while the other is used to pull them down again. The Hattersley drop box is an adaptation of the Knowle's motion, with the chains

discarded, and a positive action obtained by the use of a direct lever connection between crank wheels and boxes.

Electric filling stop motion for looms. Victor F. Sepavich (to Crompton & Knowles Loom Works). USP 2 482 943, Sept. 27, 1949.

This invention provides an electric filling stop motion of the kind which will not require actual closure of an electric switch by the weft fork. This result is effected by use of an electronic circuit with a grid control dependent merely upon movement of the filling fork to a position close to a metallic body. The fork and the metallic body in effect are parts of an electric condenser which is normally of such low capacitance as to permit the detecting circuit to maintain the grid in a condition which will prevent firing of the electronic tube, but when the weft fork due to absence of the filling moves close to the metallic plate or the like it effects a substantial increase in the capacitance of the condenser the effect of which is to alter the grid in such manner as to allow electric current to flow through the electronic tube to effect loom stoppage.

Fabricated bobbin releaser for weft replenishing looms. William A. Blanchard (to Crompton & Knowles Loom Works). USP 2 484 399, Oct. 11, 1949.

In a bobbin releaser for a weft replenishing loom having a bobbin delivery cradle, the releaser comprising 2 elongated sheet metal elements arranged side by side and secured together, one of the elements having a bobbin cradle operating wing bent laterally therefrom.

Filling catcher. Chas. E. Pelletier. USP 2 482 363, Sept. 20, 1949.

A filling catching attachment for a loom comprises a base to be mounted on the breast beam of the loom, an L-shaped rod slidably mounted in the base and positioned with a vertically positioned leg of it extended downwardly, a collar having a sloping surface on the forward end carried by the rod, a spring on the rod urging the collar rearwardly, and a latch arm pivotally mounted on the base and extended across the L-shaped rod for locking the rod through the collar of it. The latch arm is positioned to be reciprocated vertically to unlock the collar when the loom makes a bobbin change. Resilient means on the base urge the latch arm downwardly.

Filling seersucker. Anon. *Am. Wool Cotton Reptr. 63*, 9-10 (Nov. 10, 1949).

Rayon filling seersucker fabrics are similar to rayon warp seersuckers except that the variation in the fabric is in the filling direction. Filling seersuckers are easily produced on box looms. A soft, flexible filling seersucker is analyzed which uses a large proportion of acetate yarn. There are 36 picks of 150 denier acetate in the filling direction followed with 8 picks of 150 denier viscose hard-twisted yarn.

Filling thread cutter for weft replenishing looms. Gabriel C. Beatrice (to Crompton & Knowles Loom Works). USP 2 471 809, May 31, 1949.

A thread cutter for weft replenishing looms comprises a support formed with a lateral lug and having a cutter blade fixed to it. A second cutter blade is pivotally mounted on the support and has upper and lower arms on opposite sides of the lug. An adjustable stop screw on the support engages the upper arm to vary the position of the second blade relatively to the fixed blade when the upper arm engages the stop screw. Operating roll means are provided for the second blade. An adjusting screw, supported by the lower arm and operatively connected to and supporting the roll means, is rotatable relatively to the second blade so as to vary the position of the roll means relatively to the second blade.

Harness frame for looms. Richard G. Turner (to Crompton & Knowles Loom Works). USP 2 483 857, Oct. 4, 1949.

This invention provides a harness frame with resilient heddle bars which are free at one end so that they may be sprung slightly when heddles are being fitted to or strung along them. The harness frame is made with continous side, top and bottom elements and has the bottom element welded or soldered to a bearing by which the harness frame can be reciprocated.

Heald shaft for looms. Albert Blickenstorfer (to Grob & Co.). USP 2 482 149, Sept. 20, 1949.

A heald shaft for looms has 2 stationary rails connected by side supports and movable members on them. Each of the rails comprises a flattened tubular section of light low strength metal, a top and bottom web formed on each rail, and reinforcing means secured on the free ends of each web. The reinforcing means are of a higher strength material than the rails and provide running tracks for the movable members so that a light weight, durable heald shaft is obtained.

Improved automatic loom designed to ensure trouble-free weaving. Anon. *Textile Recorder 67*, 80-1 (July 1949).

The Hattersley 4 x 1 box automatic bobbin-changing loom is described which embodies refinements such as (1) automatic pick finding, (2) positive, open shed, baulk lever dobby and (3) automatic mechanical warp stop motion; it is suitable for weaving woolen and worsted fabrics with up to 4 colors of weft.

Improving twill demand. Geo. Creasey. *Textile Age 13*, 32, 34, 39 (Oct. 1949).

Suggestions for loom settings that will make quick changeovers are presented. An appraisal of the twill market is also given.

Means for illuminating loom parts. James C. Parker. USP 2 483 840, Oct. 4, 1949.

This invention provides a source of illumination for a loom reed and means automatically operable upon stoppage of the loom for energizing the source of illumination to illuminate the loom reed and also the harness frame adjacent to the reed.

Method for distributing warp threads in circular looms. Victor M. J. Ancet (to Regina S. A.). USP 2 483 118, Sept. 27, 1949.

The present invention is for use in a circular loom for distributing the warp threads from the beams and supplying the threads to a harness mechanism. The new distributing means include a plurality of straight distributing elements, which are of such length and so arranged that the groups of warp threads passing through adjacent elements to the heddle eyes of the harness mechanism are kept from contact with all other parts of the mechanism. The distributing elements may be small reeds and, in that event, a circular guide is provided for so directing the threads between the beams and the distributing reeds that the threads are kept from continued contact with the ends of the reeds. Accumulation of waste and flock between the dents of the reeds at the ends thereof is thereby avoided and the threads, as they are manipulated by the harness mechanism, reciprocate between the dents and keep the reeds clean.

Modern cotton weaving; secret of success. M. C. Dutt. *Indian Textile J. 59*, 975-80, 987 (Aug. 1949).

The influence of safe and proper working conditions and the effect of modern machine developments on improving cotton weaving are discussed. The desirable characteristics of yarn, warping and winding, sizing and humidity, the weaving shed, lighting, lifting of heavy items, medical assistance and health of workers are dis-

cussed. The influence of each of these factors on weaving improvement is considered.

Nylon-rayon fabric. William A. Corry. PB 96 585. Oct. 1948. *Bibl. Sci. Ind. Reports 11*, 406 (May 1949). 2 p. table. Microfilm $1.25; Photostat $1.25.

Parallel motion and picker stick snubber. John Rinne (to M. W. Kellogg Co.). USP 2 484 119, Oct. 11, 1949.

A parallel motion and picker stick snubber for fly shuttle looms comprises a frame structure adapted to rock with the sword rocker shaft and a picker stick bumper pivotally supported on the frame structure between the picker stick and the side of the loom in position to be rotated angularly by the overthrow of the picker stick. Spring means resist overthrow movement of the picker stick and urge the bumper about its pivotal support angularly towards the picker stick. An adjustable stop in the form of a screw member is threaded into the frame structure for limiting the angular movement of the bumper toward the picker stick.

Pick mechanism for looms. James M. Tuten (to Draper Corp.). USP 2 483 987, Oct. 4, 1949.

This invention provides a loom pick cam having a toe support and a toe positively adjustable on the support to a position in which absolute linear contact with a pick ball may be secured at any desired point along the active surface of the toe; it further provides a loom pick cam having a hub and a rim composed of a plurality of cam face forming members and comprising two parts one of which may be pivotally adjusted and locked with respect to the other about an axis lying in a plane substantially perpendicular to the axis of the hub, whereby absolute linear contact may be secured between the one part and an associated pick ball.

Picker stick check. Everett H. Ashton, Robt. G. Mallard & Elvin A. Mastriani (to M. W. Kellogg Co.). USP 2 484 065, Oct. 11, 1949.

This invention provides a picker stick check, for fly shuttle looms, comprising a cam member fixed to the upper end of the picker stick and having a pair of connected diverging cam surfaces, resilient means arranged to engage the cam surfaces and to stop the picker stick in a predetermined position as it returns toward stopping position, and means for varying the separation of the resilient means to control the stopping position of the picker stick.

Picking mechanism for looms. Gabriel C. Beatrice (to Crompton & Knowles Loom Works). USP 2 481 812, Sept. 13, 1949.

A picking mechanism for a loom includes a picking cam and picking shaft provided with an arm, a bearing shell surrounding part of the arm, bearing rollers between the shell and arm, a picking shell surrounding the bearing shell having an inner surface formed with conical areas inclined toward each other and toward the arm. Inherently resilient soft elastic sleeves between the shells have inner surfaces engaging the bearing shell and have conical outer surfaces engaging the conical surfaces of the picking shell. Spaced disks are provided on the arm between which the shells and sleeves are located.

Pneumatic thread control system for weft replenishing looms. Geo. N. Peterson (to Crompton & Knowles Loom Works). USP 2 482 690, Sept. 20, 1949.

A pneumatic thread remover for weft replenishing looms comprises a stationary tripping means, a tube having a thread intake mouth, a valve rotatable on the tube to vary the size of the mouth, and means on the tube for engagement with the tripping means to rotate the valve relatively to the tube to vary the size of the mouth.

Pneumatic thread remover for weft replenishing looms. Geo. N. Peterson (to Crompton & Knowles Loom Works). USP 2 482 691, Sept. 20, 1949.

A pneumatic thread remover for weft replenishing looms comprises a tube in which sub-atmospheric pressures exist and having communicating primary and secondary thread intake mouths in it. A valve on the tube normally closes the primary mouth only due to the sub-atmospheric pressures but is movable against the action of the pressures to open the primary mouth. Guard means on the tube above the mouth limit the upward movement of the thread relatively to the mouth.

Pneumatic thread system for weft replenishing looms. Geo. N. Peterson (to Crompton & Knowles Loom Works). USP 2 482 689, Sept. 20, 1949.

A pneumatic thread system for weft replenishing looms comprises a source of sub-atmospheric pressure and a pneumatic thread remover including a tube pneumatically connected to the source and normally spaced from the thread but moving to a pick-up position adjacent to the thread on a weft replenishing beat of the loom. The remover

has an intake mouth for the thread, a slide valve for the mouth on the tube, and means cooperating with the remover to control the valve and to cause it to close the intake mouth partially when the remover is spaced from the thread and slide along the tube to open the mouth when the remover moves to pick-up position.

Relation of reed width to cloth width. Anon. *Textile Mfr. 75*, 409 (Sept. 1949).

A study of a large series of woven fabrics showed that a plot between cloth contraction expressed in per cent and ratio of ends to picks (E/P) yields a smooth curve which can be used to determine how wide the cloth should be reeded to obtain a given fabric width.

Removal of fluff and dust in circular looms. V. M. J. Ancet (to Regina S. A.). USP 2 480 690, Aug. 30, 1949.

A method of eliminating fluff and dust from circular looms comprises sucking the fluff and dust out of the warp threads by a sucking device located axially of the loom. The fluff and dust are then discharged into the natural filtering bag formed by the sheath of fabric being woven on the loom on its way towards the cloth beam.

Spun rayon-wool gabardine. S. A. Prokuski. *Textile Industries 113*, 129, 131, 209, 213 (Nov. 1949).

Much cloth rejection in rayon-wool blended gabardine production is caused by startup marks made at the time the loom is started. The 3 general types of start-up marks are: cracks or thin marks, thick or heavy marks, set marks or ripples. Causes and preventive measures for these marks are discussed.

Shedding means for circular looms for weaving. Henry J. Cooper. USP 2 476 357, July 19, 1949.

A shedding means for circular looms for weaving in accordance with this invention has oscillatable shedding blades and spacers mounted on a member which has a projection, or projections, whereby it can be supported in position in the loom, the arrangement being such that the projection, or projections, are of sufficient dimensions to ensure adequate freedom from vibration when the loom is in operation, while at the same time the shedding blades cannot become separated from the member during operation, but can be moved into operating position when the loom is being set up without dismantling the member or its supporting projection, or projections, from the loom.

Shuttle-guiding device in circular looms. Henri Pelcé (to Societe dite: Saint Freres S. A.). USP 2 473 172, June 14, 1949.

A shuttle-guiding device for a circular loom comprises a shuttle raceway composed of a ring of platens retained between a pair of parallel annular supports, adapted to guide the shuttle in its circular motion and across the intervals of which the warp threads can be shifted up and down. A lining of bristles is provided on the inside of either support in the interstices of which the threads belonging to either sheet of the warp can lodge clear of the shuttle in either open condition of the shed.

Weft laying needle mechanism for Axminster looms. Herbert A. Whitin (to Crompton & Knowles Loom Works). USP 2 477 357, July 26, 1949.

It is customary in Axminster looms to introduce the weft by means of an elongated needle which is guided by a needle rail extending from one side of the loom. This rail is about as long as the loom is wide and occupies an objectionably large amount of floor space. This invention provides a weft laying needle of flexible sheet metal provided with transverse ribs or the like which cooperate with a rotary actuator located at one side of the loom. The needle curves around the sprocket and then leads upwardly instead of laterally from the loom and for this reason the loom occupies considerably less floor space.

Weft tension take-up for looms. Hardy B. Gosnell. USP 2 482 975, Sept. 27, 1949.

A weft tension take-up for looms, having a lay provided with a raceplate on the top of it with a transverse groove adjacent each end of the lay and having a shuttle box disposed on each end of the lay, is claimed. The device comprises an oscillatable member disposed above and to one side of the top of the lay and having a downwardly projecting finger. Fixed means on the loom are adapted to engage the oscillatable member and to swing its finger laterally to engage a filling cast across from one shuttle box to the other end to move the filling laterally to exert tension on it after the filling has been extended from one shuttle box to the other and during the beat up operation.

What do we mean by good weaving? 3. Morland. *Silk & Rayon 23*, 1198, 1200, 1202 (Sept. 1949).

Practical hints to increase loom efficiency and to decrease loom stoppage are given. Work curves

for daily efficiency and weekly efficiency are presented. Efficiency may be increased by relieving the weaver of the extra work involved in starting a new warp. The work involved in starting a new warp is described.

Knitting C 3

Air cleaner for flat knitting machines. Louis Imbriani (to Frances Speier). USP 2 482 670, Sept. 20, 1949.

An air cleaner is claimed for a flat knitting machine in which there are independent needles, one or more beds containing the needles, a cam carriage, and means adapted to move the carriage back and forth lengthwise of the bed. The air cleaner comprises means providing a compressed air supply on the carriage and one or more nozzles connected to the air supply means and associated with the knitting cams on the carriage to blow lint away.

Circular hosiery machines. Anon. *Am. Wool Cotton Reptr. 63,* 10 (Nov. 3, 1949).

Mass production of hosiery with low unit cost on circular hosiery machines with dials is possible when special attachments are used, such as dial cams and lugs on chain links. Details are given for knitting hosiery with 6 x 3 rib shank and upper foot portion; heel, sole, ring toe and toe pocket of plain stitch; and 1 x 1 ribbed top.

Circular knitting machine. Philip A. Brooks. USP 2 481 718, Sept. 13, 1949.

In a circular knitting machine having a needle cylinder and a container into which the knitted product is drawn mechanically, means for protecting such product from oil is claimed. The means comprises an elongated tube, the upper portion of which is disposed within the cylinder and adapted to receive the product and direct it to the container. An inverted substantially-conically shaped member is secured to the tube near the lower end of it and spreads outwardly above the open upper end of the container.

Control chain on seamless hose machines. H. Wignall. *Textile Mfr. 75,* 430-31 (Sept. 1949).

The timing chain on the model Super 14 machine made by Stibbe and Co. consists of detachable links which have projections to initiate 13 different knitting operations. In circular knitting there are 12 knitting courses to each link of the chain. For oscillatory knitting, as in the heels and toes, there are 6 courses to each link of the chain.

Diaper. Maurice S. Dayan. USP 2 483 756, Oct. 4, 1949.

A diaper comprises superposed knitted layers of material made of soft yarn, the diaper being substantially rectangular, the layers being stretched in the direction of their greatest dimension but not transversely thereof; the layers being stitched together around the entire peripheral edges thereof with the layers in stretched condition, and being extensible transversely of the greatest dimension to facilitate handling and adjusting into position for wear, so that the diaper fits the wearer's body snugly without causing discomfort, the layers being absorptive in high degree.

Fabric guiding device. Eugene St. Pierre (to Hemphill Co.). USP 2 483 355, Sept. 27, 1949).

In a circular, independent needle, knitting machine having a cylinder, means for guiding knitted fabric which includes a finger having a portion projectable into the cylinder across the needle circle along an arcuate path, the finger being adapted to contact knitted fabric and guide it downwardly into the cylinder and prevent it from bunching, and means for so projecting the finger in a plurality of progressive, timed steps.

Flat knitting machine. Vanity Fair Mills, Inc. Australian P. 133 609, April 24, 1946.

A machine employing needles, tongues, sinkers, sinker nibs and thread guides includes a single supporting shaft on which the knitting needle and the tongue supporting means are mounted.

Flat knitting machine. Vanity Fair Mills, Inc. Australian P. 133 656, Aug. 26, 1946.

A flat knitting machine employing stationary thread guides arranged above stationary sinkers includes hook knitting needles, mounted to move up and down through the sinkers and through sinker nibs, means causing the needle hooks to travel in a closed figure eight path and means to close the needles. The movement of the needles is such as to draw the threads while between the thread guides on the up strokes and to hook the threads on the down stroke.

Guide bar construction for warp knitting machines. Richard F. Eshleman (to Am. Viscose Corp.). USP 2 480 231, Aug. 30, 1949.

A warp guide bar construction for warp knitting machines comprises a supporting base having a plurality of aligned tangs, each projecting laterally from the base and then extending back to form a U-shaped hook adjacent the portion of the

base from which the tang extends. A U-shaped guard member is carried by the ends of the tangs. The face of the guard member opposed to the base is spaced sufficiently from it to provide free passage of the yarns between them.

Hosiery. Henry Mayer. USP 2 484 522, Oct. 11, 1949.

A heel construction for a stocking blank having opposed portions for the heel of the stocking, widening lines in the portions for the sides of the heel, and narrowing lines in the portions for the bottom of the heel, the narrowing line for the bottom of the heel in one of the portions being spaced from and extending at an angle to the widening line for the same portion of the heel and the narrowing line for the botton of the heel in the other of the portions extending at an angle to and forming a continuation of the widening line for the other side of the heel to cause the foot of the completed stocking on the last mentioned side to conform to the arch of the foot.

Knitting machine. Roy C. Amidon (to Vanity Fair Mills Inc.). USP 2 469 360, May 10, 1949.

A flat knitting machine comprises a stationary needle guide with at least one tongue; a movable sinker bar; at least one thread guide for at least 2 knock-over sinkers mounted on the sinker bar and spaced apart into which space the end of the tongue projects. Needles having hooks closable by the tongues when the needles are at one end of their stroke are carried by a needle bar and guided by the needle guide. The needles are operable through the space between the sinkers conducting thread to the needle. Means are provided for operating the needle bar, sinker, and thread guide in timed relation to effect a knitting operation.

Knitting machine. Paul W. Bristow (to Scott & Williams, Inc.). USP 2 470 803, May 24, 1949.

In a knitting machine of the superposed cylinder type, means are provided for feeding main yarns to the needles and for feeding plating yarns to the needles with means for effecting changes of the main yards fed to the needles. Means are also provided for inserting into action, maintaining in action, and removing from action the plating yarn independently of changes of the main yarns which are fed to the needles simultaneously with the plating yarn. An elastic yarn may also be inserted independently of changes of the main and plating yarns.

Knitting machine. George O. Young (to Vanity Fair Mills). USP 2 480 175, Aug. 30, 1949.

An improvement is claimed for a flat knitting machine which employs knitting needles and tongues, stationary sinkers, means for supporting and operating the needles and tongues, means for supporting the sinkers, movable thread guides, and movable sinker-nibs. The improvement comprises sinker-nib carrying and operating means, and thread guide carrying and operating means. The last 2 means each include a reciprocatable plunger, a single shaft having supports with bearings for the plungers and in part supporting the sinker-nib carrying and operating means and the thread-guide carrying and operating means. A second shaft is provided with means carried by the second shaft for supporting in part the sinker-nib and the thread-guide operating means.

Knitting machine and patterning mechanism therefor. Roland Peberdy (to The Bentley Eng. Co., Ltd.). USP 2 463 639, Mar. 8, 1949.

For a knitting machine this invention provides a patterning mechanism of the type comprising a cyclic patterning device having contrasting physical characteristics at its periphery, a feeler movable in accordance with said characteristics, a racking mechanism for racking the device round through its cycle to present successive portions of its periphery to the feeler, and an operating connection extending from the feeler for effecting or controlling operations in accordance with the dictates of the device; there is, in combination, a stopping means for the racking mechanism tending, when rendered operative, to stop the patterning device when the latter reaches a predetermined point in its cycle, a collapsible joint in the aforesaid connection for rendering the connection inoperative, upon collapse of the joint, irrespective of the response of the feeler to the patterning device, and a control mechanism for rendering the stopping means inoperative and for erecting the joint.

Loop regulating mechanism for straight knitting machines. Emil J. Berger & Howard K. West (to Dexdale Hosiery Mills). USP 2 470 131, May 17, 1949.

A loop regulating mechanism for straight knitting machines has a loop regulating shaft with an affixed arm which is actuated by a rotary cam on the cam shaft of the machine. A second arm on the loop regulating shaft contacted by a screw adjustable in a press arm is actuated by a press arm on the cam shaft. A lever on the press cam has a pivotal connection at its outer end with the corresponding end of a freely fulcrumed swing lever arranged to be actuated by coaction later-

ally with circumferentially spaced projections of a rotary can on a separate cam shaft. The pivotal connection comprises a pin which is rotatively adjustable in the end of one of the levers and which has an eccentric portion engaged in the end of the other lever.

Machine gages are a "must" for fixers. H. B. LeFeaux. *Textile World 99,* 134-35 (Sept. 1949).

The introduction of new high-speed full-fashioned hosiery machines have made a knowledge of the proper gages for the fixer to use more important and at the same time increased the number of these gages. A double-page chart with figures and silhouettes is given that should prove of value to fixers.

Method of knitting. Isaac H. C. Green (to Hemphill Co.). USP 2 451 215, Oct. 12, 1948.

This invention provides a method of knitting which includes the steps of feeding a body yarn to needles, raising at least 2 needles to a wrap yarn receiving height, feeding the same wrap yarn to the hooks of all of said raised needles, further raising the leading one of said raised needles to clear its latch and thereafter causing all of the needles to pass through the knitting wave whereby the wrap yarn is cast off by the leading needle and knit by the remainder of the needles that were raised to wrap yarn receiving height.

Motion for warp knitting machines. William O. Traumuller (to Kidde Manufacturing Co., Inc.). USP 2 482 811, Sept. 27, 1949.

This invention provides a mechanism for imparting endwise movement to a longitudinally movable guide bar in a warp knitting machine, the mechanism comprising a pattern cam for imparting longitudinal movement to the guide bar, and a drive for continuously rotating the cam including means having cooperating surfaces of varying contour for continuously and alternately effecting fast and slow rotative movement of the cam while the cam is rotating.

Pattern mechanism for knitting machines. Emil J. Berger & Howard K. West (to Dexdale Hosiery Mills). USP 2 473 503, June 21, 1949.

A pattern control mechanism for knitting machines comprises a sprocket drum about which a timing chain is trained with a group of control elements normally positioned in the paths of cam projections on the chain and supported on a slide for independent movement. The slide is restricted to movement toward and away from the chain on a fixed guide, and a spring means tends to retract the slide and withdraw the control elements out

of range of the cam projections when it is desired to reset the latter to starting position. A shaft with a radial stop projection engages the slide to keep it in normal position. Means on the shaft can be turned to permit retraction of the slide by the spring means.

Point illuminating and magnifying attachment for looping machines. Shepard Schwartz (to May Hosiery Mills). USP 2 481 450, Sept. 6, 1949.

A visual aid attachment for a looping machine, having a rotatable dial and a relatively fixed stud at the center of the dial, comprises rotatable means associated with the stud and supporting an arm extending outwardly from it. A magnifying lens is carried by the arm and is positioned to magnify the dial points in the location that the work is applied to them. Means carried by the arm move the lens with the dial to follow the application of work to the dial points, and operator controlled means associated with the first mentioned means move the lens in the opposite direction.

Safety mechanism for preboarding machines. Fred Backhus (to Proctor & Schwartz). USP 2 484 668, Oct. 11, 1949.

In a preboarding machine of the type described in USP 2 419 645 (see TTD:4, 228) a mechanism is provided which is operable automatically to prevent the operator of the machine from lowering the dome in the event that one or more of the stocking forms is in the outward or spread position.

Sinker actuating mechanism for knitting machines. Emil J. Berger & Howard K. West (to Dexdale Hosiery Mills). USP 2 473 355, June 14, 1949.

A sinker actuating mechanism for straight knitting machines includes operating jacks individually associated with the sinkers, a reciprocating slur cock with receding cam surfaces complementally sloped relative to a center point for actuating the jacks to advance the sinkers. An element is movably mounted on the slur cock and provides stop edges for respectively trailing the center point of the slur cock as the latter is traversed in opposite directions. One or more jacks are temporarily restrained in the wake of the center point, and back slap of the corresponding sinkers is prevented. Fixed abutments at opposite ends of the path of traverse of the slur cock are adapted, by cooperation alternately with the element, to position it so that one of its stop surfaces trails the slur cock during traverse in one direction, and its other

stop surface trails the cock during traverse in the other direction.

Stocking. Earl T. Floyd (to The Nolde & Horst Co.). USP 2 466 885, Apr. 12, 1949.

A self-suporting garter band may be knitted on a known machine adapted to produce so-called terry cloth fabric, by suitable adjustment of the yarn feeds and sinker actions. The stocking is desirably knitted throughout in a continuous succession of weft courses of the relatively inelastic yarn fed to the needles in usual manner, with the added highly elastic yarn in the band portion simultaneously laid in front of alternate needles and to the rear of intermediate needles and engaged by interlacing with alternate needle wale loops without interknitting. The normal fabric loops employed in the leg and foot portions of the stocking are formed as usual by drawing the loops over the nose of the sinkers and the abnormal length loops employed in the garter band and formed by an advanced position of said sinkers so the loop stitches will be formed over the top of the sinkers.

Straight-bar knitting machine. Harry W. Start & Ernest Start (to Wm. Cotton Ltd.). USP 2 472 175, June 7, 1949.

In a straight bar knitting machine a reciprocatable carrier-driving member and a reciprocatable slurcock driving member are provided. A mechanism, which comprises 2 tooth geared elements meshing with one another, couples the 2 members together to be traversed to and from a common driver for ensuring a constant lead of one member over the other. Means are provided for rotating one of these gear elements in one direction at one traverse and in the opposite direction at the next traverse and so on in alternation.

Straight bar knitting machine. William G. Macdonald & William A. Cooper (to William Cotton Ltd.). USP 2 480 943, Sept. 6, 1949.

A straight bar knitting machine comprises a single frictional device for driving a plated splicing carrier from a draw of Coulier mechanism, stops or their equivalent for variably determining the length of traverse of the carrier, and means for disconnecting the carrier from the frictional device in the region of the end of the carrier traverse and for re-establishing the connection at the commencement of the carrier traverse in the reverse direction.

Tension device. John A. Pons (to Greensboro Textile Supply Co.). USP 2 472 614, June 7, 1949.

A tension device for a knitting machine, having a pivoted yarn feed finger for feeding yarn to the needles, is claimed. The device consists of a pair of tension disks normally moved toward each other and through which the yarn passes; and a plunger having a pointed upper portion for passing between the disks and a lower portion adapted to be engaged by the end of the yarn feed finger remote from the end which feeds the yarn to the needles. When the yarn feed finger is moved to operative position, the plunger moves upwardly between the disks to remove any clamping effect on the yarn passing between the disks. When the yarn feed finger is moved to inoperative position, the plunger moves downward from between the disks to cause the disks to clamp the yarn.

Wrap yarn controlled stop motion mechanism for knitting machines. Clyde W. Cox (to Ethel W. Cox). USP 2 472 649, June 7, 1949.

A knitting machine has a revolving wrap stripe mechanism disposed above it and comprises a table supported by the mechanism. The table has a plurality of vertically disposed holders for holding yarn cones filled with wrap yarn mounted on the upper side. Each of the holders is slotted vertically and has a member pivoted in the slot near its lower end. The holders also have outwardly biased resilient means for engaging the interior of the lower end of the cone. The yarn cone has a slot in one side coinciding with the slot in the holder over which it is fitted. The yarn wound on the cone serves to hold the pivoted member in the holder in elevated position and prevents its falling out through the slot in the tube due to centrifugal force. A stop motion actuating mechanism is disposed adjacent to the periphery of the table for engagement with the pivoted member when it moves under centrifugal force outwardly through the slot in the yarn tube to horizontal position to actuate the stop motion mechanism.

Yarn feed and control mechanism. Marion E. Blake & Raymond A. Gartman (to Vanity Fair Mills, Inc.). USP 2 476 274, July 19, 1949.

This invention provides a mechanism which will effectively operate to feed or let off exact amounts of yarn per cycle, cycles or fraction of a cycle of the machine using the yarn, such as a knitting machine or weaving machine.

Special fabrics C 4

Apparatus for cutting venetian blind tapes. Geo. S. Mack. USP 2 483 587, Oct. 4, 1949.

A loom for weaving pairs of tapes having interconnecting cross-straps and being connected by cross-over threads has a rock shaft and means

for moving the woven tapes as they are woven. A cutting apparatus is claimed for the loom for severing the cross-over threads of the tapes, and means actuated by the rock shaft move the cutting apparatus into a cutting position in advance of the cross-over threads for severing the cross-over threads. Means actuated by the rock shaft repeatedly impart a consistent range of intermittent reciprocatory movement to the cutting apparatus in a vertical direction during each severing operation to further assist in the severing operation.

Apparatus for the treatment of fabrics. Raymond P. Allen (to Seiberling Rubber Co.). USP 2 472 057, June 7, 1949.

Apparatus for treating tire fabric while spread flat comprises a fabric dipping means with facilities for conveying fabric through it while spread flat; drying means which consists of rotatable means of large diameter over which the fabric passes while spread flat; and between these, rotatable means of uniform diameter over which the fabric passes while spread flat. A mechanism which includes a stalled torque motor connected with a reversible switch maintains the rotatable means in a constant position lineally with respect to the dipping and drying means so that the tension on the fabric is controlled and maintained substantially constant.

Bonding fabrics. Ronald G. Bartlett, John L. Moillet & Reginald J. W. Reynolds (to Imperial Chemical Industries Ltd.). USP 2 483 330, Sept. 27, 1949.

Three or more plies of fabric are bonded together by a process which comprises applying to one or more of the plies at least 70% by weight of a mixture of a polyvinyl alcohol and a condensate of formaldehyde and urea or related compound, wetting the other pieces, and pressing all the plies together at a temperature not below 100°C. and not so high as to scorch the fabric.

Composite pile and nap face fabric and method of making same. Edmund K. Flynn (to Goodall-Sanford, Inc.). USP 2 482 581, Sept. 20, 1949.

A method of forming a novel fabric having a composite pile and nap face consists in subjecting a cut V warp pile fabric, having filling yarns passing at the face alternately over 2 ground warps and under 2 ground warps, to a napping operation acting to raise in nap form a portion of the filling, where it passes over the 2 ground warps, into the spaces between the pile tufts.

Composite textile article. Ralph Hinchliff (to

Burson Knitting Co.). USP 2 484 293, Oct. 11, 1949.

This invention provides a shaped knitted protective jacket for liquid containers and the like, having a self-sustaining peripheral wall and an end wall, the jacket comprising a series of side-by-side rings formed from yarns comprising fibers which exhibit different shrinkage properties at a given temperature, the rings comprising the yarns formed from the more readily shrinkable fibers alternating regularly with the rings comprising the yarns formed from the less readily shrinkable fibers, and the more readily shrinkable fibers being heat-shrunk and stiffened.

Elastic fabric. Andrew Silvain. USP 2 484 125, Oct. 11, 1949.

This invention provides an elastic fabric formed at least partially of covered elastic threads, comprising an elastic core, at least one coating of a rubber-like product covered with dressing threads and an outer layer of unvulcanized rubber-like product, and subsequently vulcanized, the threads forming the fabric adhering together by the unvulcanized outer layers and being bonded together by the subsequent vulcanization, whereby the finished product constitutes a homogeneous elastic system.

Fabrics containing terephthalate polyesters. Imperial Chemical Industries Ltd. Australian P. 133 874, Mar. 7, 1947.

To improve resistance to abrasion and to the passage of water, woven, knitted or braided articles have evenly dispersed through them between 25-90% of their weight of wool, cellulose or regenerated cellulose or protein fibers or filaments and between 10-75% of their weight of staple fibers or continuous filaments composed essentially of one or more of the highly polymeric linear esters derived from a terephthalic acid body and a glycol of the series HO $(CH_2)_nOH$ where n is between 1 and 10.

Laminated materials. Imperial Chemical Industries of Aust. and N. Z. Ltd. Australian P. 133 608, Mar. 21, 1946.

Sheets of flexible fibrous materials formed by weaving, felting or matting, are coated or impregnated with a composition comprising one or more polymerizable liquids. The sheets are pressed to distribute the composition uniformly and the assembly is held so that the sheets remain parallel until the composition has been solidified by polymerizing. Polymerization takes place below the

boiling point and at a corresponding pressure for any constituent.

Lubricating means for comb bars and bobbin shuttles for lace looms. Edw. W. Medbery (to Marshall Field & Co.). USP 2 482 425, Sept. 20, 1949.

Lubricating means for traveling bobbin shuttles for lace looms comprise a base member which is secured to the loom, an oil reservoir on the base member, a capillary oil conveyor extending into the oil reservoir and into the path of travel of the bobbin shuttles so that intermittent engagement of the oil conveyor and bobbin shuttles is obtained by the oscillating of the bobbin shuttle. Means intermediate its ends hold the capillary oil conveyor onto the base member.

Machine for cutting double pile fabrics. Woodruff T. Sullivan (to J. B. Martin Co.). USP 2 476 780, July 19, 1949.

This invention provides an efficient temple means, whereby part of a pile fabric is retained in a transversely stretched or taut condition while a band knife is operating to cut the pile, thereby separating the fabric or cloth into 2 pieces, and subsequently winding these pieces on separate wind-up rolls located preferably at the rear of the machine.

Manufacture and construction of furnishing fabric trimmings. A Crossland. *Textile Mfr. 75*, 414-16 (Sept. 1949).

Methods for modifying conventional looms for manufacturing fringe, seaming lace and other specialties from yarn left over from weaving curtains, tapestries and moquettes are discussed.

Manufacture of blankets, blanket material, felt substitutes, and carpet material. Arthur P. Benthall (to Bird & Co.). USP 2 472 511, June 7, 1949.

A process for the manufacture of a differentially woolenized jute fabric comprises weaving the fabric with a hard-spun, thin, strong warp and a thick, loosely-spun weft using a broken twill weave; subjecting the woven fabric to a treatment with caustic until the weft is completely woolenized; washing out the excess caustic before any appreciable woolenizing of the warp takes place; and submitting the resultant fabric to a "nap-raising" treatment. The surface of the fabric is constituted primarily of weft the bulk of which being, for equal weights of fiber, at least twice that of the warp.

Manufacture of pile fabrics. Hans Van Issum (to Fabric Development Co., Ltd.). USP 2 480 984, Sept. 6, 1949.

A process for manufacturing a pile fabric comprises forming a layer of solid pierceable and removable supporting substance, forming a pile in the substance by inserting strands through the layer so that the strands protrude from a surface of the layer, applying a backing to the protruding portions of the strands, and removing the layer from the strands to expose a pile fabric.

Method and machine for the manufacture of cut-edge fabrics. Willi B. Wagner (to Geo. Auerbach). Can. P. 445 795, Dec. 23, 1947.

A method of dividing a fabric formed from threads of a thermo-plastic synthetic resinous material comprises passing a web of said fabric between a heated rotating roller and an unheated cutting element maintained in contact with one another, the temperature of the heated roller, the pressure existing between the roller and the cutting element and the rate of movement of the web of fabric being so adjusted that the fabric is divided and the severed threads of the fabric are fused together by the combined action of the hot roller and the cutting element without undergoing any substantial decomposition, the web being positioned away from the hot roller and guided into contact therewith by the unheated cutting element.

Method and means for forming pile fabric. Wm. N. Moore (to Russell-Lacey Mfg. Co., Inc.). USP 2 482 683, Sept. 20, 1949.

A tufting machine for forming reversible pile fabrics comprises a reciprocating needle for inserting successive doubled portions of a continuous pile yarn in a fabric base so as to form loops of the yarn extending from one face of the fabric base. Means are provided for training the yarn to form a loop extending from the other face of the fabric base as each succeeding doubled portion of the yarn is inserted in the fabric base. Means are also provided for cutting the loops extending from at least one of the faces to form chenille ends.

Method of making fabricated articles. Jon Gregg. USP 2 473 024, June 14, 1949.

A process for making a layered article comprises arranging strip portions of semicured rubber, which are thicker at their midportions than at the edge, between strip portions of flexible fibrous material of the same width. The article is then subjected to heat and pressure in a mold for curing the semicured rubber and to unite the flexible

strip portions. The resultant articles may be used in making outsoles for footwear, rugs, and the like.

Method of making laminated cushion material. George W. Blair & Virgil H. Bodle (to Mishawaka Rubber and Woolen Mfg. Co.). USP 2 480 316, Aug. 30, 1949.

A method of making laminated cushion material, particularly adapted as a carpet or rug underlay comprises calendering a sheet of vulcanizable plastic material, then heat-softening the sheet progressively lengthwise and pulling successive heat-softened portions of it consecutively sidewise to form successive corrugations. A backing sheet is then continuously advanced conjointly with the corrugated sheet along a predetermined path in contacting by side relation. The backing sheet is constantly compressed against crown portions of a series of the corrugations, and simultaneously the crown portions are subjected to vulcanizing temperature to vulcanize the crown portions to the backing sheet.

Non-woven or bonded fabrics. J. Bromley & G. H. Elliot. *Textile Recorder 67*, 77-9 (July 1949).

Fibrous webs for making bonded fabrics are formed either on cards or garnets in the conventional manner, or alternatively on machines resembling the Shirley Pneu opener by air laying. A series of 3 to 9 cards builds up a multi-layer wadding which is compressed by means of a calender and then heated on a drum (for thermoplastic fibers) or impregnated with a bonding agent and dried (for non-thermoplastic fibers). Influence of fiber composition, bonding agents and methods of finishing on strength and other properties of the fabric are discussed. At the present time 8 companies in the U. S. are in production on bonded fabrics at a rate exceeding 50,000,000 sq. yd. per yr.

Pile and knife guide for pile cutting machines. Jos. A. Firsching. USP 2 482 407, Sept. 20, 1949.

A pile and knife guide for pile cutting machines comprises a member made of a single piece of wire which is folded double and spot welded in a portion of it and which branches outwardly from the folded part to form a V-shaped opening for the admittance of a circular knife. The branch portions of the wire turn inwards towards each other and come together in parallel relation and are then doubled back each upon itself so as to form members for strengthening the guide.

Pile fabric. Wm. N. Moore (to Russell-Lacey Mfg. Co., Inc.). USP 2 482 682, Sept. 20, 1949.

A reversible pile fabric comprises a fabric base having pile tufts inserted in it at spaced intervals and extending from both faces of it. The pile tufts are formed by doubled strands of pile yarn provided in predetermined uniform lengths and cut to form chenille ends on at least one face of the fabric base.

Simple elastic weaves—smallwares No. 17. A. Thompson & Sigfrid Bick. *Brit. Rayon & Silk J. 26*, 58-60, 73 (Sept. 1949).

The numbering system and methods of making and covering rubber yarns and the method of warping rubber yarns are discussed briefly. The fabric constructions of several narrow fabrics using rubber yarns are explained along with designs for each. Also given are the factors affecting the degree of relaxation of rubber threads in a fabric.

Surgical dressing element. Jean F. Le Lous. USP 2 481 316, Sept. 6, 1949.

A surgical dressing for wounds and sores consists of smooth, non-porous, non-absorptive, non-combustible, imputrescible, non-metallic glass fibers, interchanged with one another to form an open-meshed dressing which permits draining from the wound and avoids adhesion of the dressing to the wound. The dressing contains an oiling substance in an inner part of the dressing for imparting flexibility to it and having a surface of the dressing de-oiled. The de-oiled surface, when placed in contact with the wound, avoids contact between the oiling substance and the wound.

Tufting machine. Robt. H. Bradwell & John D. Brock (to Russell-Lacey Mfg. Co., Inc.). USP 2 482 647, Sept. 20, 1949.

A tufting machine includes a work support, work feed means including a feed dog arranged near the work support, a reciprocatory bar for moving a needle to points above and below the work support, and a drive shaft with a crank disc mounted on it. A link pivotally connects the crank disc and reciprocatory bar, and a crank is mounted on the crank disc for rotation with it. A second reciprocatory bar is arranged near the first bar with a link pivotally connecting the crank and second bar. An upper reciprocatory looper is arranged above the work support and is connected with the second bar to be moved by it; a lower reciprocatory looper is arranged beneath the work support and is driven from the drive shaft. Means including a blade sever the loops from the upper looper, and means including

a blade sever the loops from the lower looper.

Inspection and testing C 5

Fundamental study of fabric properties. E. Vernon Lewis. *Rayon & Syn. Tex. 30,* 53-4 (July 1949); 44-6 (Aug. 1949).

See TTD: *6,* 459.

Good hosiery inspection insures product quality. Anon. *Textile World 99,* 140-41, 246, 248 (Sept. 1949).

The high standards used by the Richmond Hosiery Mills, Rossville, Ga. in the manufacture, quality control, and inspection of their product at various points is described. The handling and storing of yarn and hosiery goods is discussed briefly.

Fabric applications C 6

Composite screen for cinematographic and other projections. Leopold Darimont. USP 2 484 334, Oct. 11, 1949.

A photographic projection screen for causing the sensation of stereoscopy comprises a base sheet, a thin white sheet of tightly woven muslin in front of the base sheet, and 2 sheets of coarsely woven canvas in front of the muslin sheet, the canvases comprising dull metalized threads which are disposed in general vertical and horizontal positions, the canvas sheets being oriented relative to each other so that their threads are angularly offset relative to each other.

STANDARD FINISHING D

Application of short infrared rays to the problems of drying in the textile industry. G. Seurin. *L'Industrie Textile 754,* 289-93 (Sept. 1949).

This account (presented at the Institut Textile de France) considers: (1) Various theoretical aspects of infrared drying; experience has proven that many false ideas have been spread concerning this question resulting in erroneous interpretations; (2) the characteristic ideals of a rational drier, and the S.E.P.S. (oven) as a solution which has been perfected over a period of 5 years of uninterrupted work; (3) the comparative economic factors which justify the use of infrared drying in industry as a whole and textiles in particular.

Automatic feeding device for cloth. Julien Dungler. USP 2 484 020, Oct. 11, 1949.

A feeding mechanism for supplying cloth to tenter frames and like machines is provided with a motor and adjacent their movable inlets with electric

contact means for cooperation with the selvedge of the cloth and for regulating supply of current to the motor. Controlling means correspondingly adjust a tenter inlet in response to lateral deviations of the cloth as it is fed to the inlet. A movable member is operatively connected with the tenter frame, and an element is arranged for driving connection with the motor. Electromagnetic means are carried by the element, and coupling means are adapted for cooperation with the electromagnetic means and are operatively connected with the member for displacing it to effectuate adjustment of the position of the tenter inlets.

Bleaching nylon fabrics. R. D. Bennett. *Can. Textile J. 66,* 49 (Sept. 30, 1949).

The whiteness of nylon may be increased by blue tinting with an acetate or acid color. Where bleaching is necessary, the Textone-acetic acid method is most satisfactory for an all nylon fabric. Bleaching is carried out at the boil for 30 minutes in a solution containing 0.5 lb. of Textone and 0.5 lb. of glacial acetic acid per 100 gallons of water.

Cloth feed control. Fred T. Miller (to United Merchants & Mfrs., Inc.). USP 2 482 497, Sept. 20, 1949.

A cloth feeding apparatus includes a drive motor for delivering cloth from one station, a second motor for delivering cloth to a second station, and a J box to which the cloth is delivered by the first motor and from which it is withdrawn by the second motor. The J box is mounted for limited movement from one position when full to another position when only partially full. A circuit control is provided for the second motor and is adapted for actuation by the movement of the box. The circuit control comprises switch means in the circuit of the second motor actuable by the movement of the J box, and the switch means upon actuation is adapted to open to break the circuit of the second motor when the J box is partially full.

Cloth or piece feeding device for textile and other machinery. Chas. H. Turner. USP 2 481 369, Sept. 6, 1949.

A list opening apparatus which will remove creases, folds or rolls from cloth so they can be fed flat onto any adjacent machine, such as a tentering machine, is claimed. The apparatus includes a top plate, a bottom plate hinged at one end to the top plate, upper and lower blades disposed on opposite sides of the bottom plate, means pivotally

connecting the blades to the bottom plate, and means for adjusting the blades relatively to each other. The blades are offset relative to each other and are disposed at an angle to the direction of feed of the material through the machine.

Controlled finishing of nylon knit fabrics. A. J. Nisbet. *Am. Dyestuff Reptr. 38,* 773-74 (Oct. 31, 1949).

This is a discussion of the "Trianized" process for setting nylon. The process uses high temperature, high velocity air as the setting medium. The temperatures used are just under the melting point of nylon. To handle the fabric on a continuous single thickness basis a pin tenter with automatic tension control, overfeed and uncurling devices is employed.

Developments in rayons and synthetic fibers. Anon. *Silk & Rayon 32,* 1204-14 (Sept. 1949).

Recent developments in textile finishing include: 1) a new melamine-formaldehyde process in which the "near-condensed" resin in the form of a dispersion instead of the conventional monomer is applied to the textile fabric; 2) new non-ionic compounds based on ethylene oxide which are finding use as softening agents, detergents, and restrainers in dyeing; and 3) vat dyeing of acetates in the presence of lower aliphatic alcohols to prevent saponification of the rayon.

Drying apparatus. Bernard R. Andrews. USP 2 473 629, June 21, 1949.

A drying apparatus comprises a drying space through which the web material is fed and which has top and bottom walls and open sides. A plurality of radiant heat generating units are situated both above and below the web and project radiant heat against the web. The units are spaced from each other in the direction of feeding movement of the web material, and each extends transversely across the space. Means are provided to establish high velocity whirling cyclonic currents of air between each 2 adjacent units which prevent the web material from being unduly heated and also assist in the drying operation.

Hydrosulfites. G. Brearly & J. Starkie. *Am. Dyestuff Reptr. 38,* 775-79 (Oct. 31, 1949).

See TTD: *6,* 470.

Infrared drying in the textile finishing industry. H. Haas. *Melliand Textilber. 30,* 369-72 (Aug. 1949); *in German.*

The differences between drying by the infrared method and conventional methods are considered

and the advantages of the former method described.

Machine for the wet treatment of textile materials or the like. Marcel Cassé. USP 2 482 319, Sept. 20, 1949.

A machine for treating textile material, in particular washing, dyeing, bleaching, etc., is claimed. The machine comprises a vertically disposed cylindrical vat to contain the material, a housing enclosing a portion of the vat and having the inner wall surfaces spaced from the outer wall surfaces at the enclosed portion to provide a chamber. The chamber communicates with the interior of the vat only at the central lower end portion and at the upper peripheral portion so that a bath circulating circuit is provided. A perforated closure means of equal passage areas are provided in the circuit at the points of communication. The perforated closure means at the upper peripheral portion has the shape of a frustocone and has the larger base of it contiguous with the periphery of the vat. Means located within the housing propel the bath through the circuit in either direction.

Method and apparatus for continuous run treatment of sheet materials. Earl J. Fisher. USP 2 481 992, Sept. 13, 1949.

The rolling of flexible fabric or sheet material for continuous run processing consists in initially rolling a predetermined amount of the material on a roll which in amount is appreciably less than a complete roll of the material. The material is then doubled on itself between the roll and source and rolled in double ply to form a portion of a second roll in which one ply comes from the source and the second ply from reverse rotation of the first roll. The material coming merely from the source is rolled on the second roll to completion after exhaustion of the material from the first roll.

Mode of action of cellulose ethers as additions to synthetic detergents. Ernest Bartholome & Karl-Friedr. Buschmann. *Melliand Textilber. 30,* 249-53 (1949); *in German.*

It is shown that the increase in the washing action as well as the simultaneous protection against re-soiling caused by additions of cellulose ethers to washing agents, is explained by the assumption of a displacement of the dirt taking place at the fiber surface in the sense of the described exchange of places between the dirt and the cellulose ether.

Napping machine. Wilfred N. Hadley (to Parks & Woolson Machine Co.). USP 2 472 584, June 7, 1949.

A napping machine includes a drum and rollers for leading cloth around the drum through a path tangent to the drum at at least one point. A frame is mounted for rotation at each end of the drum with a roller mounted on the frame in position to span the drum beneath the cloth and spaced from the point of tangency. A motor driven means moves the frames so that the roller may be moved either to lift the cloth from the drum or to permit the cloth to touch the drum. A motor driven means feeds the cloth; and a control operable alternatively cuts off the power to the feed means and simultaneously lifts the cloth, starts the feed means and moves the frames simultaneously to permit the cloth to touch the drum.

New bleaching process protecting Naphthol AS dyeings. I. G. Farbenindustrie A. G. PB 74 026t11. Mar. 1948. *Bibl. Sci. Ind. Reports 11*, 92 (Feb. 1949). 6 p. Available from Research Information Service, 509 5th Ave., New York 17, N. Y. Price $8.50.

Practical aspects of wetting and detergency. E. S. Paice. *J. Textile Inst. (Proc.) 40*, P876-90 (Sept. 1949).

The more important practical applications of surface active agents are reviewed. From an industrial standpoint the properties of wetting, emulsification, and detergency are extremely important. The 3 main classes of surface active agents—anionic, cationic, and non-ionic—are discussed in detail, and examples of their chemical structure shown. Actual industrial uses are cited, which include applications in the following fields: textiles, fur and leather, laundry, engineering (electroplating, degreasing, pickling, etc), shampoos, cosmetics, pharmeceuticals, dairy and food industry, horticulture, and other miscellaneous industries.

Process for delustering and roughening synthetic and natural yarns and fabrics. Zellwolle- u Kunstseide-Ring, GmbH. PB 70 415t2. July 1948. *Bibl. of Technical Reports 12*, 27 (July 1949). 10 p. Available from Research Information Service, 509 5th Ave., New York 17, N. Y. Price $9.50.

Report on Dr. Schoellers' conference of textile auxiliaries. I. G. Farbenindustrie A. G. PB 95 192. n. d. *Bibl. of Technical Reports 12*, 60 (Aug. 1949). 36 f. Micro BIOS AG 3, Frames not numbered. Microfilm $2.25; Enlargement Print $6.25; *in French.*

No abstract available.

Scouring procedure for nylon goods. Anon. *Rayon & Syn. Tex. 30*, 114 (Sept. 1949).

Four methods of scouring nylon fabrics are discussed briefly: 1) boil-off or scour on a jig; 2) boil-off or scour on a continuous boil-off machine; 3) boil-off or scour in book or skein form; 4) rope boil-off or scour in a beck. Methods of removing stains which are resistant to normal scouring treatments are also noted.

Stenter efficiency improved by new cloth guiding system. Anon. *Textile Recorder 67*, 84 (July, 1949).

The new guider for the Spooner stenter is described. The device employs the conventional mechanical feelers but is so designed that electronic scanning could be used. The mechanism is sensitive, but without the tendency to "hunt" or develop unnecessarily prolonged action. The guider head contains a device for straightening curled or folded selvedges.

Tentering machine. Jas. A. Grundy (to John Bromley & Sons, Inc.). USP 2 482 270, Sept. 20, 1949.

A tentering machine comprises a tenter frame having a pair of laterally adjustable members, a pair of feed rolls in alignment with the members, a pair of feed brushes mounted on each of the members, and means for driving the feed rolls and the feed brushes in a predetermined constant ratio with each other. The means include a sprocket on one of the feed rolls, a sprocket on each of the feed brushes, a shaft in alignment with the centers of the feed brushes, a pair of sprockets slidable on the shaft, chains connecting each of the slidable sprockets to the feed brush sprockets. Connecting means include spur gears between the shaft and the feed roll sprocket.

Textile auxiliary products and processing of textiles. I. G. Farbenindustrie A. G. PB 95 617. 1940-1945. *Bibl. Sci. Ind. Reports 3*, 201 (Mar. 1949). Frames 4352-4518. Enlargement Print $22.50; *Text in German and English.*

Use of hydrotropic solutions in the textile industry. Anon. *Textile Recorder 67*, 83 (July, 1949).

Hydrotropic agents increase the solubility of slightly soluble chemicals in aqueous solutions. 100 ml. of a 40% solution of a hydrotropic agent —sodium xylene sulfonate—will dissolve more than 24 g of benzaldehyde while only 0.4 g of this substance will dissolve in 100 ml of distilled water. Data are presented on (1) the water solubility of

sodium xylene sulfonate at different temperatures, (2) surface tension and specific gravity of the sulfonate solutions as a function of concentration and (3) relative solubilities of various organic compounds in sodium xylene sulfonate solutions of various concentrations.

DYEING AND PRINTING E

Action of light on cellulose acetate rayon and nylon dyed with Duranol, Dispersol SRA, and Solacet dyes. G. S. Egerton. *Am. Dyestuff Reptr. 38,* 608-13 (Aug. 22, 1949).

This is reprinted from *J. Soc. Dyers Colourists,* Oct. 1948. (See TTD: *6,* 735.)

Application of chrome mordant dyestuffs. Anon. *Silk & Rayon 23,* 1086-92 (Aug. 1949).

Chrome mordant dyestuffs, although not of the highest fastness standards, are used in a number of printing styles such as handkerchiefs and cretonnes because of their ease of application. For hand washing many of the colors are satisfactory, but for articles to be machine laundered the fastness properties are not entirely satisfactory. Detailed descriptions of techniques useful in printing this class of dyestuffs are given.

Contribution of solvation to the stability of anthraquinone vat dye suspensions. D. P. Graham & A. F. Benning. *J. Phys. & Colloid Chemistry 53,* 846-60 (1949).

Water suspensions of anthraquinone vat dyes are essentially hydrophobic in that they are not flocculated and redispersed reversibly. Although many approach the properties of unsolvated suspensions, others show much greater stability to flocculation by electrolytes. This high stability may limit the value of a color for specific dyeing purposes. Particles of dyestuff which adhere to the fibers do not migrate, and suspensions which are stable alone but which flocculate readily upon cotton are preferred. It is, therefore, desirable to relate the stability of an anthraquinone vat dyestuff suspension to its migration tendency in terms of the principal factors determining that stability. This study has concluded that the tendency of certain anthraquinone dyestuffs to migrate is associated with an unusually high stability of their aqueous suspensions to flocculation by electrolytes. Solvation is indicated to be a principal source of this "excess" stability.

Disposal of dyehouse wastes. Anon. *Can. Textile J. 66,* 44-5 (Sept. 30, 1949).

Dilute liquid wastes should not be mixed with strong wastes since they may be disposed of without special treatment. Strong wastes may be made acceptable for admittance to municipal sewers by (1) partially neutralizing (pH-8) and (2) regulating the volume of discharge so as to avoid overloading the city sewerage system.

Dyeing of broad-woven nylon fabrics. S. G. Turnbull, Jr. *Am. Dyestuff Reptr. 38,* 747-55 (Oct. 17, 1949).

This discussion includes the following topics: preparation of nylon goods for dyeing, bleaching of nylon fabrics, dyeing of nylon fabrics, improvement in level-dyeing properties of acid colors on nylon fabrics, new dyes for nylon, dyeing of highly delustered nylon fabrics, dyeing of spun nylon fabrics, dyes for nylon stable to high temperatures, dyeing of nylon unions, stripping of dyes and resins from nylons, and newer methods of dyeing nylon.

Dyeing of viscose rayon in cake form. A. S. Cluley. *J. Textile Inst. (Proc.) 40,* P901-03 (Sept. 1949).

A new machine representing a departure from the traditional design of package dyeing units is described. This machine has 2 outstanding characteristics: (1) one-way flow—from inside to outside of cakes in order to prevent collapse of cakes which occurs with 2-way flow. A machine of this type is less complicated, is cheaper to construct, and allows the use of an open vessel; (2) the cakes are supported on horizontally disposed tubes so that end-to-end contact of cakes is achieved. This cake-to-cake joint is a better seal against channeling of dye liquor than are the seals on previous machines.

Dyeing the new textile fibers. Irving Teplitz. *Textile Age 13,* 40, 42-4, 46 (Oct. 1949).

The basic physical and chemical properties that influence the dyeing of synthetic fibers, such as Orlon, Vinyon N, Vicara, and the rayons, are discussed.

Factors influencing crockfastness of package-dyed naphthol cotton yarns. South Central Section, AATCC. *Am. Dyestuff Reptr. 38,* 786-88 (Oct. 31, 1949).

The present paper was limited to a study of 2% dyeings of Naphthol ASSW developed with 2% KB base and 7% RN salt. The following principal dyeing operations were considered in this paper as to their influence on crockfastness: (a) yarn preparation, (b) naphtholation, (c) developing, (d) soaping, and (e) softening.

Levelling agents for indanthrene dyes. I. G. Farbenindustrie A. G. PB 19 933t3. Aug. 1948. *Bibl. Sci. Ind. Reports 11,* 92 (Feb. 1949). 26 p. tables. Available from Research Information Service, 509 5th Ave., New York 17, N. Y. Price $29.00.

May change "standard observer". Anon. *Standardization 20,* 241 (Sept. 1949).

Recent work at the Natl. Bur. of Standards indicates that the "ICI standard observer", that is, the fundamental data on color mixture accepted internationally for interpreting colorimetric measurements since 1931, may need to be revised. Difficulties with the colorimetry of titanium-pigment paints, corroborated by data from Harvard Medical School and Eastman Kodak, indicate that the standard luminosity function is too low in the short-wave end of the spectrum. At least until completion of studies of the luminosity function here and abroad, the NBS will continue to base its color standards on the 1931 ICI standard observer, however.

Neon red fluorescent dyed nylon fabrics. F. G. Battles. PB 96 891. Jan. 1949. *Bibl. of Technical Reports 12,* 4 (July 1949). 2 p. Microfilm $1.25; Photostat $1.25.

Brief report giving conclusions of tests to determine the relative color fastness of 2 samples of Neon Red Fluorescent Dyed Nylon Fabrics when subjected to laundering, dry-cleaning and exposure to light. (AAF TSEAM MR 670-21L.)

Pressure dyeing. A. V. Ivitsky. PB 96 646. *Bibl. Sci. Ind. Reports 11,* 383 (May 1949). 66 p. photos, drawings. Microfilm $3.00; Photostat $8.75.

Problems in dyeing Orlon being solved by duPont. Paul L. Meunier & Robt. J. Thomas. *Am. Wool Cotton Reptr. 63,* 11-12 (Oct. 27, 1949).

Some of the properties of Orlon plus its resistance to water have made Orlon difficult to dye. The modification of existing dyeing processes to overcome the difficulties in dyeing Orlon is described.

Small package dyeing is making headway. Albert P. March. *Textile World 99,* 106-07, 224, 226 (Sept. 1949).

A standard small tube with $\frac{5}{8}$ in. inside diameter and a length of $6\frac{3}{4}$ in., made either of resin impregnated paper or stainless steel and covered with an ordinary knitted stocking or a permanent parchment paper sleeve, is being increasingly used in package dyeing. Treatments of cotton or

wool by dyeing, shrinkproofing, resin impregnating, mechanical or air extracting, and drying are described; advantages and disadvantages of some of the types of equipment are discussed.

Some effects of tension in dyeing and printing. Anon. *Textile Mfr. 75,* 417-21 (Sept. 1949).

"Watering" of mixed fabrics containing cellulose acetate may be avoided by 1) reducing tension during processing, 2) cooling the batches before they are removed from the machines for drying, and 3) drying immediately after removing from the dyeing machine. In top dyeing the tops should be wound loosely and evenly with no tension. The slivers should not be too thick and for vat dyeing, should not weigh more than 4 lbs. In roller printing the application of a high degree of tension is essential. One of the possible results of lack of tension in the preparation of cloths for printing is production of creases at the printing machine. Although tension is essential, excessive tension may cause bursting of badly sewn ends in light fabrics and may also result in crooked threads and frayed areas.

Some recent observations on the theory of the dyeing of wool with chrome dyes. J. F. Gaunt, Patons & Baldwins Ltd. *J. Soc. Dyers Colourists 65,* 429-33 (Sept. 1949).

In this paper an attempt is made to give the present position of the theory of dyeing with chrome dyes on wool by considering separately: (a) combination of wool and chrome, (b) combination of wool and dye, and (c) combination of chrome and dye. Formulas are shown for the possible reactions occurring in each of the above cases as are the results of laboratory experiments verifying the reactions.

Special dyeing processes for indanthrene dyes. I. G. Farbenindustrie A. G. PB 19 933t4. Aug. 1948. *Bibl. Sci. Ind. Reports 11,* 92 (Aug. 1948). 51 p. tables. Available from Research Information Service, 509 5th Ave., New York 17, N. Y. Price $79.00.

Synthetic fibers and their dyeing. I. G. Farbenindustrie A. G. PB 95 543. 1941-43. Frames 3664-3687. *Bibl. Sci. Ind. Reports 11,* 489 (June 1949). Enlargement print $5.00; *in German.*

Difficulties in screen printing. Anon. *Can. Textile J. 66,* 41-4 (Sept. 30, 1949).

The techniques of screen printing are discussed with special reference to methods of eliminating printing faults. Specific instructions are outlined

for preparing the printing foundation, for using surface adhesives and print pastes. Useful suggestions are given for eliminating "marking off", "pin marks", "sparking" and other faults associated with discharge printing.

Intaglio printing on textiles "Blankophor". I. G. Farbenindustrie A. G. PB 95 600, 1942. Frames 5031-5077. *Bibl. Sci. Ind. Reports 11*, 516 (June 1949). Enlargement Print $7.50; *in German.*

Multicolor printing. Astra I. Sark. USP 2 482 941, Sept. 27, 1949.

A multi-color printing machine in which printing is effected by a printing surface which consists of or contains the dyes which effect printing, comprising a flat reciprocable printing surface, an adjustably weighted impression roller which rides on the back of the material which is being printed during the printing operation, and adjusts itself automatically to the height of the printing surface, rollers for paying out and taking up the material to be printed which passes in a loop between the rollers and beneath the impression roller, means whereby the impression roller may be raised and supporting means for holding the impression roller raised clear of the printing surface, the material when printed temporarily adhering to the printing surface and being peeled off the printing surface by being wound on to the take up roller when the traverse of the printing surface is completed and after the impression roller has been raised clear thereof.

New cloth structures for printing. A. Johnson. *Textile Mfr. 75*, 420-21 (Sept. 1949).

It is suggested that a wide range of fabrics at present difficult to print because of their rough surfaces (twills, ribs and honeycombs) could be brought into the printing field by incorporating soluble yarns into the weave structures which will be subsequently removed by scouring.

Printing bed for screen-process printing machines. Louis Martin. USP 2 480 493, Aug. 30, 1949.

A printing bed for a screen process printing machine comprises a pair of parallel endless metal bands, pulleys supporting the bands at their looped ends, evenly spaced and uniformly dimensioned slats extending traversely of the bands and fastened to them with their ends in alignment. A continuous blanket is secured to the surface of the slats, and a table having a flat surface is positioned to support the upper reach of slats. Guide means extend longitudinally of the table surface and are

adapted to prevent lateral movement of the slats. Driving means co-axial with the pulleys at one end of the bands are adapted to move the bands and the slats along the table.

Printing on fabrics or paper. F. Janê. Australian P. 133 861, Oct. 18, 1946.

An arrangement for printing on fabric or paper comprises an assembly wherein the fabric band is stretched on the printing table by guide rollers which may also be driving rollers, and the printing stencils are arranged on a frame capable of turning with respect to its axis in such a way that the printing stencils may be consecutively lowered manually or mechanically onto the fabric stretched on the printing table. The fabric is wound off a bale over a guide roller and is stretched on the table by means of the driving roller, then passed over a drying arrangement to the roller onto which it is wound. If a number of printing tables are arranged at corresponding distances from the axis of rotation of the frame, a simultaneous printing with same set of stencils is possible. A modification, where the driving roller is fitted with axial bars and the distance from the axis of the roller is regulated so that the effective diameter of this roller may be changed, is also described and claimed.

Printing vinyl films requires textile methods. Anon. *Textile World 99*, 142-43, 222, 224 (Sept. 1949).

There are 3 methods of printing on vinyl film: roller printing, screen and air brush, and transfer. The last 2 are discussed very briefly. Roller printing is discussed in some detail, including the ink properties necessary, the engraving, the vinyl film itself, and the back gray. A comparison of the textile type and the unit type machines is given in the text and in a table.

Studies in the fundamental processes of textile printing. I—Transfer of dye from thickener to fiber substance during steaming. R. H. Munshi & H. A. Turner. *J. Soc. Dyers Colourists 65*, 434-47 (Sept. 1949).

In this paper an attempt was made to reduce the complexity of the normal printing processes on cellulosic fabrics in order that the characteristics of dye transfer from the applied printing paste to the cellulose under standard conditions might be studied quantitatively. The behavior of a number of purified direct cotton dyes such as Chlorazol Sky Blue FF, Icyl Orange R, Benzopurpurin 4B and Durazol Fast Orange 2 R was

studied. Experimental evidence is presented to show that in many respects the transfer properties of the dyes are similar to those which are observed when the dye is applied from aqueous solutions by a dyeing process, but important differences are also evident especially in the proportion of dye transferred from the external phase to the cellulose.

SPECIAL FINISHING F

Amide condensation products. Imperial Chemical Industries of Aust. & N. Z. Ltd. Australian P. 133 909, June 28, 1946.

Compounds capable of imparting water-repellence, softness and crease resistance to textile materials are produced by causing a salt of a tertiary amine and preferably also formaldehyde to react with condensation products of: a) fatty acid amides or the corresponding monoacyl ureas and analogous esters of carbamic and allophanic acid with fatty alcohols, or of the methylol derivatives thereof, with b) a lower alkyl ether of a methylol derivative of a compound containing primary or secondary amino groups and capable of resin-forming condensation with formaldehyde, selected from the group of amino substituted heterocyclic nitrogen compounds other than melamine, amides of polybasic carboxylic acids, urea and thiourea and substituted ureas and thio-ureas.

Chemical reaction of wool in anti-shrink processes. P. A. Alexander. *Am. Wool Cotton Reptr. 63*, 13-14 (Oct. 27, 1949).

Anti-shrink processes for wool involve a reaction between a liquid and a solid which includes a number of steps. The over-all rate of the process is controlled by the slowest of these steps. In many cases it is possible to change the controlling step from liquid film diffusion to solid diffusion and vice versa by changing the agitation, reagent concentration, liquid ratio, temperature, and electrical charge of the fiber.

Fabric reinforcement. Raymond G. Olson. USP 2 474 273, June 28, 1949.

A fabric reinforcement comprises a coating of a relatively soft fused metal having a relatively low melting point adhering to and around the threads of the fabric, and a second coating of a relatively hard fused metal having a relatively high melting point adhering to the first metal coating, whereby the reinforced fabric possesses the flexibility of the fabric with a soft metal coating and the abrasive resistant qualities of a hard metal.

Flameproofing of fibrous materials. Florence M. Ford & William P. Hall (to Joseph Bancroft & Sons Co.). USP 2 482 755, Sept. 27, 1949.

A process for flameproofing fibrous material wherein the material is impregnated with an acid-nitrogen complex compound.

Flameproofing of fibrous materials. Florence M. Ford & Wm. P. Hall (to Jos. Bancroft & Sons Co.). USP 2 482 756, Sept. 27, 1949.

A process for imparting durable flame and mildew resistance to cellulosic and protein fibrous materials consists in impregnating the material with an aqueous solution of a water soluble inorganic acid compound of the class of acids of phosphorus and sulfur, a non-metallic nitrogenous organic compound basic and soluble in the acid solution, a water soluble volatile alkaline compound to give the solution a pH of from 6 to 8 and an aldehyde compound. The material is then squeezed in a mangle to remove excess solution, dried, and heated to a temperature from 400°F to 250°F from 30 seconds to 2 hours.

Method of waterproofing textiles with zirconyl compounds. Henry L. Van Mater (to National Lead Co.). USP 2 482 816, Sept. 27, 1949.

In accordance with the present invention zirconium salts are deposited upon and employed to impregnate textile goods to render the same water resistant. To this end, certain zirconium compounds which either hydrolyze at elevated temperatures or under controlled conditions of acidity are used and particularly zirconium compounds of the water soluble fatty acids.

Moire finishing. Hans A. Holterhoff. *Am. Wool Cotton Reptr. 63*, 95-7, 110 (Oct. 20, 1949).

In a discussion of developments in moire finishing, water-repellent finishes and so-called permanent finishes are described. It is reported that acetate fabrics or mixtures are best suited for moireing.

Moth-proofing. I. G. Farbenindustrie A. G. PB 74 6544s. *Bibl. Sci. Ind. Reports 11*, 289 (April 1949). 8 p. Microfilm $1.25; Photostat $1.25.

New heat setting process for nylon and other synthetic fibers. Anon. *Brit. Rayon & Silk J. 26*, 74 (Sept. 1949).

"Trianizing" gives nylon warp knit fabrics uniformity and stability, and cuts shrinkage. It involves the application of high temperatures while running the fabric flat through a hot-air chamber at a carefully controlled speed and a temperature just below the melting point of nylon. Exposure

to the heat is brief, a few seconds at most. This alters the molecular construction of the fiber.

Patent and literature survey on shrinkage and shrinkage control of textile fabrics. Francis D. Horigan & Cary R. Sage. PB 98 017. Jan. 1948. *Bibl. of Technical Reports 12*, 100 (Sept. 1949). Microfilm $3.00; Photostat $8.75.

This survey includes references to the cause, mechanism, and prevention of laundering shrinkage of animal, vegetable and synthetic yarns, fibers, and fabrics, and garments made therefrom. Particular emphasis is given to methods for controlling the shrinkage or stabilizing the dimensions of fabrics to laundering by either mechanical or chemical means. The arrangement of the bibliography is chronological; and covers the years 1937 to 1947 inclusive. Journal abstracts and patent citations are arranged alphabetically according to subject headings for each year. Where originals were not easily available, abstract journals were used as source material. Those employed were *Chem. Abstracts, Brit. Chemical & Physiological Abstracts, Textile Technology Digest,* and the *J. of the Textile Institute.*

Process for imparting washfast water-repellency to staple and cotton goods. I. G. Farbenindustrie A. G. PB 20 543t4. Sept. 1948. *Bibl. Sci. Ind. Report 11*, 452 (May 1949). 12 p. Available from Research Information Service. 509 5th Ave., New York 17, N. Y. Price $17.50.

Process for making silver protective cloth. Elwood C. Jackson & Tully H. Babb (to Pacific Mills). USP 2 480 930, Sept. 6, 1949.

In a process of preparing silver protective cloth in which silver nitrate is reacted with sodium ferrocyanide to produce silver ferrocyanide, the improvement of carrying out this reaction in aqueous solution preliminarily to application of the composition to the cloth so as to form the silver ferrocyanide beforehand and thereby enable deposit of the silver ferrocyanide in the cloth in a one-bath procedure and without staining or discoloring the cloth.

Process of making mustard gas resistant fabric. Irving Pöckel. USP 2 481 532, Sept. 13, 1949.

A process for making mustard gas resistant fabrics includes heating together 50 parts by weight of phthalic anhydride, 50 parts by weight of sebacic acid, 100 parts by weight of dehydrated castor-oil fatty acids, and 58½ parts by weight of glycerol; raising the temperature of the mixture to about 490°F in about 1 hr; maintaining the mixture at this temperature for about 1½ hours;

and applying the mixture to the fabric as a base coating. A second mixture is then prepared comprising 45 parts by weight of sebacic acid, 55 parts by weight of linseed oil fatty acids, 25 parts by weight of glycerol. The second mixture is heated to a temperature of about 465°F; maintained at that temperature for about 1½ hours; and the resultant resin is applied over the base coating on the fabric.

Process of reducing the shrinkage and felting tendencies of protein textile materials. Mark Weisberg, Archibald S. Stevenson & Leo Beer (to Alrose Chemical Co.). USP 2 484 599, Oct. 11, 1949.

In the process of reducing the shrinkage and felting tendencies of a protein textile material, the steps of impregnating a protein textile material with an aqueous solution of a water-soluble precondensate of the group consisting of urea-formaldehyde, melamine-formaldehyde and their ethers in the absence of an acidic catalyst, mechanically removing surplus liquid from the material, drying it, thereafter exposing the impregnated textile material to steam in an atmosphere consisting of steam-volatile organic acid at a temperature in the range of 212°—substantially 220°F. for a period of substantially 5 to 8 minutes inclusive until the condensate has become water-insoluble.

Proofing proteinaceous fibers against biological attack. Eric B. Higgins (to Tewin Industries, Inc.). USP 2 483 008, Sept. 27, 1949.

Process for the treatment of a proteinaceous textile fiber to render same proofed against biological attack by the combination of pentachlorphenol with a protein at the surface of the fiber, which comprises treating the textile fiber with an aqueous liquid containing dispersed pentachlorphenol, a protective colloid and an acid substance and while maintaining the pH of the mass below 7 evaporating to dryness the resulting reaction product to render the same irreversibly stable.

Reducing the crease and wrinkling tendencies of cellulosic textile fabrics. Mark Weisberg, Archibald S. Stevenson & Leo Beer. USP 2 484 598, Oct. 11, 1949.

In the process of treating cellulosic textile fabric to reduce its tendencies toward creasing and wrinkling but without impairing its tensile strength and abrasion resistance, the steps of impregnating the textile fabric of cellulosic nature with an aqueous solution of a water-soluble precondensate of a member of the group consisting

of urea-formaldehyde, melamine-formaldehyde type resins in the absence of an acidic catalyst, mechanically removing surplus liquid from the fabric, drying it, thereafter exposing the impregnated textile fabric to steam in an atmosphere consisting of an excess of steam-volatile organic acid at a temperature in the range of 212°—substantially 220°F for a period not to exceed substantially 8 min., until the precondensate has become water-insoluble, and wherein the amount of the precondensate employed is over 100 grams but not over 300 grams of a 90-100% resin per liter calculated upon a 100% pick-up based on the dry weight of the goods.

Shrinkage control of cellulosic fibers. Leo Beer (to Alrose Chemical Co.). USP 2 484 545.

In the process of shrinkage control of textile materials, the steps of impregnating textile materials of the group consisting of natural cellulose, regenerated cellulose and mixtures with each other and up to substantially 50% of cellulose esters of organic acids, which textile materials are substantially free from starches, gums, and glues, with a dilute aqueous solution containing glyoxal and a substantially neutral, water-soluble alkali metal salt of an oxidizing acid from the group consisting of nitric, chloric and perchloric acids, removing surplus liquid from the textile material, drying without tension until most of the water has been removed and curing at a temperature above the drying temperature but not above substantially 150°C.

Treatment of wool. Roger H. Doggett & Alfred R. Johnson (to Arthur D. Little, Inc.). USP 2 482 578, Sept. 20, 1949.

A method of increasing the wear resistance of wool and paper mill felt comprises distributing on the surface of the wool fibers or felt at least 3% by weight of a treating agent and bringing the treated wool or felt to a temperature of at least 50°C for at least 1 minute. The treating agent has the formula R—X=C=Y where R is an alkyl group having a chain length of at least 10 C atoms, X is a member of the group consisting of —C and N, and Y is a member of the group consisting of O, S, and NR′ where R′ is a member of the group consisting of hydrogen and monovalent hydrocarbon radicals.

Waterproofing agent Persistol KF. I. G. Farbenindustrie A. G. PB 74 067t5. Dec. 1948. *Bibl. Sci. Ind. Reports 11*, 289 (April 1949). 4 p. Available from Research Information Service, 509 5th Ave., New York 17, N. Y. Price $2.50.

Waterproofing and sizing agent Persistol WS. I. G. Farbenindustrie A. G. PB 74 067t8. Dec. 1948. *Bibl. Sci. Ind. Reports 11*, 289 (April 1949). 5 p. tables. Available from Research Information Service, 509 5th Ave., New York 17, N. Y. Price $3.50.

Water repellent flameproof finish for spun rayon and cotton. I. G. Farbenindustrie A. G. PB 70 155t12. Nov. 1948. *Bibl. Sci. Ind. Reports 11*, 116 (Feb. 1949). 5 p. Available from Research Information Service, 509 5th Ave., New York 17, N. Y. Price $4.75.

TESTING AND MEASUREMENT G

ASTM STANDARDS ON TEXTILE MATERIALS (with Related Information). Prepared by ASTM Committee D-13 on Textile Materials. Philadelphia, American Society for Testing Materials, 1949. 574 p. Price $4.50 (to ASTM members $3.40).

This 1949 compilation provides in compact, convenient form, data and information of importance to all who deal with textile materials. In addition to the standards there are a number of appendices included which cover the following: basic properties of textile fibers: yarn number conversion table; proposed recommended practice for designation of yarn construction; psychrometric table for relative humidity; proposed recommended practice for calculating number of tests to be specified in determining average quality of a textile material; proposed method of test for accelerated aging of textiles; proposed methods of test for estimating the clean wool content in wool in the grease; proposed methods of test for evaluation of properties related to the hand of soft-finished woven fabrics; proposed specification and method of test for fire-retardant properties of treated felt; recommendations on the form of ASTM methods of test for textile materials; suggested method for magnetic rating of asbestos used for electrical purposes; and suggested method of test for vegetable matter in scoured wool. Other information in this compilation includes the following: list of papers published by the Society relating to textile materials; other ASTM publications on textile materials; and data on the officers and personnel of the Committee. Three papers presented at the March, 1949, Meeting of Committee D-13 are also included, as follows: X-ray Study of Keratin and Other Protein Fibers by Geo. C. Nutting; Abstract of Talk on X-ray Diffraction Analysis and Its Application

to the Study of Native Cellulose Fibers by Wayne A. Sisson; and Abstract of a Talk on X-ray Studies of Synthetic Fibers by A. F. Smith.

Calculation of the coefficient of variation of fiber diameter in a batch of sorted wool by synthesis of variance. R. C. Palmer. *J. Textile Inst. (Trans.) 40*, T623-28 (Sept. 1949).

The coefficient of variation of a sorted batch of wool can be found quite simply from 3 sources of variation by adding the squares of the 3 coefficients of variation. The 3 sources of variation of fiber diameter in a final sorted batch of wool are as follows: (a) variation of crimps per inch from staple to staple; (b) variation of staple mean fiber diameter for the same crimps per inch, and (c) variation from fiber to fiber in the same staple. The advantage of this method, apart from saving time, is that it shows clearly how the variability of the diameter in the sorted batch arises, and the effect of altering any one of the 3 sources of variation.

Colorimetric measurement of pH. D. I. Stock & C. W. Davies. *J. Chem. Soc. (London)* 1371-74 (June 1949).

A colorimetric method is described of measuring the pH of an aqueous solution with an accuracy of 0.01 pH unit. It is emphasized that the apparent "pH" measured with sulfone-phthalein indicators is not the same quantity as that obtained electrometrically; the relationship between the quantities measured in these 2 ways is illustrated. The dissociation constants of the malonates of a number of bivalent metals, in aqueous solution, are reported and discussed.

Determination of chlorine pickup. Edw. R. Atkinson & Neil A. Sargent. *Am. Dyestuff Reptr. 38*, 743 (Oct. 17, 1949).

To develop effectiveness measures for the removal of bound chlorine from bleached fabric, a method of measuring chlorine pickup has been developed. It employs the classical Bunsen method which is used for the analysis of chloroamines and which has been applied qualitatively to textiles by Schwarze.

Determination of the synthetic resin content of a fiber. W. Ernst & M. Sorkin. *Textil Rundschau 4*, 237-46 (July 1949); *in German.*

The determination of the resin content of a fiber is carried out by several methods. The various means of determining the resin while it is still on the fiber, the determination involving the reaction between formaldehyde and silver diamine,

and the determination of melamine by precipitation with ammonium molybdate, potassium ferrocyanide and picric acid are among those discussed. Graphical and tabular data as well as procedures for the various determinations are presented.

Determining of the fiber length and the fiber length distribution, in particular of cotton. C. Vermande. *Mededeling Van Het Vezelinstituut T.N.O. No. 84*, 55 p.; *in Dutch.*

A general survey is given of data from the literature concerning the application of fiber-length measurement, about the different criteria for describing the length and the length distribution of fibers (especially of cotton), and about the different methods of measuring. The single-fiber method has been investigated experimentally for raw cotton. The measurement of at least 1000 fibers appeared to be necessary in order to obtain well-shaped frequency curves. Besides, some tests have been made according to the ASTM standard method, using a sorting apparatus with 2 sets of combs, and measuring the fiber-length distribution according to the weight in the bulk. The differences between the results of several measurements in one sample of cotton were smaller for the sorting method than for the single-fiber method. This can be easily explained from the fact that with the first method a larger quantity of fibers is investigated. However, the sorting method gives a lower value for the mean fiber-length, which must probably be attributed to some systematical errors attached to this method. For the determination of the staple length of raw cotton a new quick method has been developed. A handful of the cotton is fixed in clamps as used with the Baer sorting apparatus. All loose fibers are combed away with a steel comb. The fibers of the tuft obtained in this way are stretched in laying them on black velvet, putting a measuring glass plate on the tuft, and removing the clamps with the tuft and the plate over the velvet. The zero-line of the plate has to lie against and parallel to the clamps. The staple length can be read on the measuring plate, after the reading place being estimated in the general image of the tuft. The skill for a good estimation must be obtained with the official American Cotton Length Standards. It has been stated from a lot of measurements that this new method, indicated in this communication as the V.I. method, gives the same accuracy as the classers' method.

Effects of strain on the microscopic structure of acetate rayon. S. Simmens & F. Howlett. *J.*

Textile Inst. (Trans.) 40, T590-604 (Sept. 1949).

The application of strain to cellulose acetate rayon results in a considerable change in the microscopical appearance of the filaments when the force is sufficiently great to either fracture or severely strain the filaments. Two main distortions of the structure occur: one is characterized by disruption of the surface, while the other has the appearance of an internal rupture. The authors indicate that the latter is a modification of the surface effect. The results obtained could be used as the basis of a test for distinguishing between chemical and mechanical breakdown.

Evaluation of adhesion by ultrasonic vibrations. Saul Moses & R. K. Witt. *Ind. Eng. Chemistry 41,* 2334-38 (Oct. 1949).

A direct, quantitative method for measuring adhesion or organic coating to both metal and nonmetal substrata is described. The method and apparatus utilize an electro-dynamic system for producing longitudinal ultrasonic vibrations in a metal cylinder. An organic film attached to the free end of the vibrating cylinder separates from the metal when the force due to acceleration exceeds the adhesion force at the interface. The accelerating force is determined by the frequency and the amplitude of vibration. The method promises to be readily applicable to many types of material other than those used in this investigation. At present it appears to have a wide utility in the study of why 2 materials adhere as in protective coatings and in bonding adhesives. More work is necessary before the limits of this method can be adequately determined with respect to thin films.

Measurement of starch paste viscosity. Welker G. Bechtel & Earl K. Fischer. *J. Colloid Sci. 4,* 265-81 (June 1949).

This article is concerned with a study of the controlled pasting of starch and an examination of the flow properties of the starch pastes by means of several instruments. The objectives of the experiments were (a) determination of differences in the flow properties of pastes made with corn starches from different manufacturers, (b) correlation of the data obtained, using different instruments, with the fluidity ratings of the manufacturers, and (c) analysis of the rheological properties of the starch pastes. For these purposes, commercial starches of the types supplied to industry were obtained. Measurements were made on the Corn Industries viscometer and the modified Stormer viscometer described in previous papers. The results show that the differences between starches can be determined systematically, and are satisfactorily reproducible, and that the data can be computed and expressed in rational units.

Minimum specifications for flannelette (dyed, printed or warp dyed). W. Werker. *Mededeling Van Het Vezelinstituut T.N.O. No. 93,* 30 p. + appendix; *in Dutch.*

The properties determining serviceability of flannellette for different purposes of service, principally clothing, are reviewed. Methods of test for these properties are described. Laundering tests in combination with physical or chemical determinations make up the main part of the investigation. The 9 different samples of flannellette used for this study were considered by manufacturers to be representative of the approximate allowable minimum serviceability. Obvious differences exist between the physical constants of the samples; the suggested minimum specifications are therefore necessarily a compromise derived from the judgments of manufacturers combined with experience about the significance of test results gained by the "Vezelinstituut T.N.O." In a previous report on bed-sheetings, a relation between one of the properties of the cloth and durability in laundry-tests was found. No such relation could be derived from the data for flannellette.

AN OUTLINE OF STATISTICAL METHODS FOR USE IN THE TEXTILE INDUSTRY. A. Brearley & D. R. Cox. Wool Industries Res. Assn., Torridon, Headingly, Leeds 6. Price: 7s 6 d per copy, post free.

. . . The object of the present publication is to make available to all in the textile industries a simple treatment of the statistical methods whose value has been proved by experience. The aim has been to provide not merely rule-of-thumb methods for arithmetical treatment of data, for a foundation on which those without a wide knowledge of mathematics can base more detailed studies. The book is divided into 6 parts. Part I consists of an explanation of the terms and methods used for the analysis of data obtained in ordinary mill work; only the simplest mathematics are used. Part II gives the elements of the theory of control charts, and shows how the results of routine testing may be presented graphically for the easy and rapid appreciation of their significance. Part III is intended for those who wish to carry out more stringent tests, where a little more mathematical knowledge is assumed, and Part IV is a

summary of the notation and the main formulae given in previous parts. Part V consists of a list of definitions of the commoner statistical terms. Part VI contains suggestions for further reading—only books which require little more than a knowledge of simple algebra have been selected. The book will be extremely useful to all who wish to appreciate modern textile research, and especially to managements, research workers, testing staff, teachers and students.—*Textile Mfr.*

Rayon industry accepts a challenge. Jay D. Runkle. *Standardization 20,* 204-6 (Aug. 1949).

In response to a request of the Natl. Retail Dry Goods Assn., the Am. Viscose Corp. recently made available through the Am. Standards Assn. its data on standards of performance of rayon fabrics. With government action to require informative labeling threatened and with the Am. Viscose data usable as a start toward an industry-established set of performance standards, rayon manufacturers and processors have now set up a Sectional Committee on Rayon Finished Fabrics. This group will develop performance requirements and test methods for rayon fabrics for various uses, the results being made available to the public by a certification and labeling procedure. Fabric uses considered are men's wear, women's wear, and home furnishings. "Rayon" will include all fibers "derived from a cellulose base", regardless of manufacturing process, and all fabrics with 50% or more rayon fibers.

Reaction for amino and imino groups in textile materials. G. R. Wallin. *Am. Dyestuff Reptr. 38,* 746 (Oct. 17, 1949).

A brief note draws attention to the usefulness of the method developed by Tarugi and Lenci for determining NH_2 and =NH groups in textile materials.

Relationship between results of dynamic absorption tests using hexagonal and cylindrical jars. M. I. Landsberg, C. Sembach & R. Blum. *Am. Dyestuff Reptr. 38,* 744-46 (Oct. 17, 1949).

Twenty-three fabrics providing a wide range of dynamic absorption values were evaluated in 2 types of glass containers. One of these, a 6 liter hexagonal jar, was the standard jar currently specified by the Quartermaster Corps for use in the conduct of the dynamic-absorption test. The other, a commercially available cylindrical container of approximately the same dimensions as the hexagonal jar, was intended as a replacement for the standard hexagonal container, which could no longer be purchased. The data showed that

the 2 types of containers could be used interchangeably for the conduct of the dynamic absorption test. Accordingly, the commercially available cylindrical jar (commonly called a museum jar) was recommended as the standard, and the hexagonal jar was considered as its alternate.

TEXTILE TESTING. Jas. Lomax. 2nd ed. London, Longmans, Green & Co., 1949. 244 p. Price 21s.

This is a second edition of a volume that first appeared in 1937. Mr. Lomax is head of the City of Nottingham Textile Testing Bur. and brings to play a vast amount of practical knowledge on this increasingly important subject. Section 1 covers identification of textile fibers; Section 2, weighing, calculations, sampling; Section 3, condition, count; Section 5, length, strength, twist, fabric weight, fabric thickness, air permeability; Section 5, humidity control, statistical treatment of results; Section 6, wool and cotton qualities; Section 7, tests on silk, rayon and wool; Section 8, fastness, shrinkage; Section 9, chemical damage on cotton; Section 10, tables of constants, regains conversions, etc. There are many illlustrations and 28 photomicrographs of fibers.—*Silk & Rayon.*

Variability of fineness of merino wool fiber. Aspects of its significance in top making. W. R. Lang. *J. Textile Inst. (Trans.) 40,* T605-22 (Sept. 1949).

Information is presented concerning the variability of fiber fineness in staples from a representative range of Australian merino wool. Hypothetical wool types of a given quality number were compounded from staple components of a limited range of variability and the coefficient of variation of fineness of the resultant stock calculated arithmetically, the proportional representation of the components with respect to fineness and crimp being based on data previously obtained. These results were used to measure the probable variability of Noble combed top, due allowances being made for the removal of noils. Conclusions were also drawn concerning the effect of known variability of the resultant staples on the variability of the resulting top.

Clothing and fabrics G 1

Determination of physical changes of a windbreak suit after two months service test in Alaska. Franz. G. Rinecker. PB 96 894. Dec. 1948. 8 p. tables. *Bibl. of Technical Reports 12,* 1 (July 1949). Microfilm $1.25; Photostat $1.25.

Report gives results of tests to analyze and compare an Arctic wind-break suit, worn without being laundered or dry-cleaned for a period of 2 months during the 1947-48 winter test season in Alaska, with new component materials, to determine the extent of deterioration of the material. (AAF TSEAA MR 66-23C.)

Do you read test values? Anon. *Textile World 99,* 153, 230, 232 (Sept. 1949).

Statistical analyses of yarn breaking strength need not be unnecessarily complex. A table with accompanying explanation shows how easy it is to find average break, average deviation, average deviation of the mean, standard deviation, coefficient of variation, precision, and percent irregularity. Also of use to the mill man is the minimum reading, and its deviation and percent deviation from the mean.

Shrink-resistant wool sweaters. I. E. Brown. *Textile Age 13,* 48-51 (Oct. 1949).

Quartermaster Corps specifications for shrink-resistant wool sweaters require that the yarn in the sweater be treated by a chlorination method such as the Harriset process or S. W. process which are described. Details of the tests for the finished goods, including the test itself, taking measurements, and computing results, are outlined.

Wristlets and waistbands, knitted wool and knitted spun nylon. Wm. O. Perry. PB 97 033. Jan. 1949. *Bibl. of Technical Reports 12,* 1 (July 1949). 8 p. graphs, table. Microfilm $1.25; Photostat $1.25.

Report gives results of tests to determine shrinkage after dry-cleaning and recovery characteristics of 4 samples of knitted wristlets and knitted waistbands. (AAF TSEAM MR 666-3H.)

Instruments and instrumentation G 2

Accelerated light fading equipment in I. G. H. Samuels & others. PB 96 668. 1948. *Bibl. Sci. Ind. Reports 11,* 280 (April 1949). 5 p. (fold drawing. Microfilm $1.25; Photostat $1.25.

Electronics in textiles. Anon. *Brit. Rayon & Silk J. 26,* 63, 75 (Sept. 1949).

The fourth annual exhibit of electronic devices was held at the College of Technology, Manchester. Among the devices displayed and briefly described are: Servodyne cloth guide and overfeed device, Marconi Instruments' pH meters, Metropolitan-Vickers' electronic microscope Type EM 3, Plessey Co.'s electronic microscope, Millard Instruments' viscometer, Type E 7565, Cintel Co.'s metal detector, Muirhead and Co.'s pH meters. Some of the above are pictured.

Improved multipurpose abrasion tester and its application for the evaluation of the wear resistance of textiles. R. G. Stoll. PB 98 014. n. d. 46 p. *Bibl. of Technical Reports 12,* 101 (Sept. 1949). Microfilm $2.50; Photostat $6.25.

See TTD: *6,* 804.

Instron tensile tester. Harold Hindman & G. S. Burr. *Am. Soc. Mech. Eng., Trans. 71,* 789-96 (Oct. 1949).

A new type of tensile-testing instrument is described, utilizing electronic principles for both the weighing of the forces on the sample and for controlling its extension. This instrument was designed with the idea of controlling these time functions accurately, and, in so far as possible, of preventing the characteristics of the machine from obscuring the accuracy of the results.

Method for measuring the reflectance of cloth samples in detergency tests. W. E. Thompson. *J. Am. Oil Chem. Soc. 26,* 509-11 (Oct. 1949).

The scanning of a number of swatches on a turntable rotating at 78 rpm or faster, with a Hunter reflectometer yields the average reflectance of the set. The use of a glass plate to cover the cloth samples does not affect the reflectance measurement. Much time and work can be saved by application of the scanning technique to detergency tests employing multiple swatches of cloth.

Movement and speed of a shuttle during a single traverse of a power loom. I—Introduction; II—Picking; III—Checking, 1 & 2; IV. I. H. Thomas. *Fibres 9,* 472-6 (Dec. 1948); *10,* 89-93 (Mar. 1949); 170-72 (May 1949); 248-49 (July 1949); 317-21 (Sept. 1949).

Instruments for measuring the speed of a shuttle at various points of its traverse of a loom are described, and the forces which act on the shuttle during picking and checking are discussed. Gages are also described for measuring the speed of projection of the shuttle on overpick looms.

New method for measurement of abrasive wear in textiles. Anon. *Textile Mfr. 75,* 442-43 (Sept. 1949).

This is a description of the capacitance method for measuring rate of abrasion, developed at the National Bureau of Standards for use in conjunction with the Schiefer abrasion testing machine. Since the abraded specimen is not destroyed nor

altered in any way during the capacitance measurement, a complete set of data may be obtained showing the rate of abrasion at all times during the life of a single specimen.

New tenacity-testing apparatus for fabrics, paper, etc. Heinrich Sulser. *Textil-Rundschau 4*, 49-53 (1949).

A hard, polished sphere is used to puncture the test sample. In tests with 19 different fabrics, tenacities and elongations at break were observed to be similar to those obtained by the conventional strip tension method of testing.

Relationship between measurements of air permeability by two machines. M. I. Landsberg & Gerald Winston. PB 97 014. *Bibl. Sci. Ind. Reports 11*, 328 (April 1949). 18 p. drawings, graphs, tables. Microfilm $1.75; Photostat $2.50.

In this paper is described the derivation of the empirical relationship between 2 commonly used instruments for determining air permeability, namely the Frazier and Gurley machines. In addition, the limitations of each of the devices are discussed as well as the number of specimens necessary for testing. The correlation has also been determined by consideration of physical constants and pressure differentials, using the empirical data obtained on the Gurley and Frazier instruments operating at a pressure of 0.5 and 1.26 in. of water, respectively, as well as data obtained on the Frazier machine at the same 2 pressures. The equations derived were log Y_f= log 533.0—1.02 log X_g' based upon the empirical data alone and log Y_f=log 507.5—log X_g when the physical constants of the machine were considered.

Sunlight from electricity. Richard S. Sheets. *Westinghouse Engineer 9*, 170-73 (Nov. 1949).

This summary of sunlamp developments, including announcement of a new fluorescent sunlamp which has long life and high energy output from 2800 to 3200 Angstroms, may be of value to workers concerned with light-testing textiles.

Textile instruments XII. Methods of measuring the D.F.E. of hair fibers, 1 & 2. R. W. Moncrieff. *Fibres 10*, 205-08 (June 1949); 244-47 (July 1949).

Part I is a discussion of methods of measuring the directional friction effect (D.F.E.) of hair fibers. The violin-bow method, the wet violin bow, the lepidometer, and the apparatus of Frishman, Smith and Harris are considered. Part II is a

discussion of the methods and apparatus of Lipson and Howard, Martin and Mittelmann, Mercer, Bohm, and Lindberg and Gralen.

Textile instruments XIII. Measuring the moisture content, 1-3. R. W. Moncrieff. *Fibres 10*, 289-92 (Aug. 1949); 330-33 (Sept. 1949); 351-53 (Oct. 1949).

Part I—The term regain is defined and the reasons for the variation in regain between different fibers is explained. The cellulosic fibers which are characterized by the possession of a multiplicity of hydroxyl groups having a marked affinity for water molecules, have a high regain. The high degree of regain in wool is attributable to the free amino and carboxylic acid groups. Such fibers as nylon, Vinyon, Velon and Orlon have few or no polar groups and therefore a low moisture regain. Also cited are regain values on various materials as used in Britain, Switzerland and the U.S.A. Part II—The British Standards Institutions's method for determining oven-dry weight is described, as are several moisture testing ovens which can be used for making these determinations. Instruments described include: (1) Goodbrand Moisture Testing Oven; (2) the Fielden Drimeter; (3) the Speedy Moisture Meter; (4) the Steinlite Meter. The operating characteristics and precision of each of these are cited. Part III—An instrument intended for the rapid measurement of moisture regain of raw cotton and grey cotton yarns is discussed. This moisture meter, which operates on a resistance principle, measures the electrical resistance of the cotton containing various percentages of moisture. The higher the moisture content the lower the resistance. The methods of carrying out the tests, and the accuracy of the instrument are described in detail.

Weight arm for testing machines. David C. Scott & Frank A. Valentine (to Scott Testers). USP 2 480 779, Aug. 30, 1949.

In a testing machine, a lever arm is mounted to swing in response to pull on a specimen being tested. A weight carrying member is provided on the lever arm with a weight adjustably mounted on the member to vary the load on the lever arm. A scale indicates the relative position of the weight on the member, and means to adjustably mount the member on the lever arm varies the load on the lever arm. A scale indicates the relative position of the member on the lever arm.

TEXTILE MILLS H

Air-conditioning unit steps up mill efficiency. Anon. *Textile World 99*, 144-45 (Sept. 1949).

A carefully planned and well-engineered air-conditioning system at Bath Mills has increased efficiency 3 to 5%, reduced ends down in the spinning room 3 to 4%, and increased quality of product, employee morale and personal efficiency. Controls are locked in a box and changes made only by the superintendent. The system consists of Bahnson Humiducts and a complete air-conditioning unit.

America looks to the dyehouse of the future. Irving Teplitz. *Silk & Rayon 23*, 1225-26 (Sept. 1949).

The ideal layout and equipment for a modern dyehouse are described.

Belle Vue pre-view—what to look for at the textile machinery and accessories exhibition, Oct. 12-22. Anon. *Silk & Rayon 23*, 1253, 1256, 1258, 1261-2, 1266, 1268, 1274. 1278, 1285, 1289-90, 1292, 1294 (Oct. 1949).

A survey of the spinning machinery, British and U. S. winding and throwing machines, British looms, Continental machinery, and finishing machinery and accessories, shown at the Manchester Textile Machinery & Accessories Exhibit, is presented.

Cast insulated panels used in woolen mill. E. H. Helliwell. *Textile World 99*, 138-39 (Sept. 1949).

Sandwich-type wall panels, made at the factory site, were used in the construction of Cocheu Woolen Mfg. Co., East Rochester, N. H. Each panel consists of a 2 in. core of Foamglas with outside panels of 1½ in. concrete. The wall is lighter, has better insulating qualities, and is about a dollar per sq. ft. cheaper than a brick wall.

Central station system in card room. Anon. *Textile Industries 113*, 96-7 (Nov. 1949).

A central station air conditioning system installed in the card room (at Bemis Bros. Bag Co.) is reported to give uniform relative humidity, increased regain in material, less dust and fly, etc. A technical description of the system is presented.

Developments in the cotton, rayon and silk industries in Germany during the period 1939-1945. F. Charnley & others. PB 97 834. 1949. *Bibl. of Technical Reports 12*, 60 (Aug. 1949). 178 p. photo, diagrams, drawings and tables. Available from Brit. Information Services, 30 Rockefeller Plaza, New York 20, N. Y. Price $1.00.

An overall summary of the German textile industry based upon a critical analysis of the contents of hundreds of reports prepared by British and American investigators on this industry and hundreds of German plants. Appendix includes 2 lists, one of 28 pages giving trade names and compositions of German auxiliary textile products and the other of 30 pages giving German textile plants and their principal products. (BIOS OR 13.)

Easy method for cleaning filter bags. Anon. *Textile Industries 113*, 95 (Nov. 1949).

A suction device for cleaning air filter bags quickly and with no dust being spread in the vicinity is described.

Economics of tricot fabrics. Alan C. Lorin. *Textile Age 13*, 7, 10, 14, 18 (Oct. 1949).

Tricot or warp knit fabrics are one of the most profitable fabrics in the textile industry today. An analysis of the factors that make tricot fabrics so important is presented.

Effective instrument maintenance. 1. E. A. Murphy. *Textile Industries 113*, 87-91 (Nov. 1949).

Basic operating principles, installation, and maintenance factors of industrial instruments such as pressure type thermometers are discussed to aid a mill in establishing an effective maintenance program.

Fabric folding machine. George Haeberlin (to Richmond Pierce Dye Works, Inc.). USP 2 482 764, Sept. 27, 1949.

This invention provides a zigzag folding of fabric by means of one or more rods moving through a closed path.

Finishing plant paces West-coast textile expansion. Richard L. Bean. *Textile World 99*, 155, 157 (Sept. 1949).

Natl. Dyeing and Finishing Corp. finishes a great variety of fabrics, running as many as 10 different constructions per day. The new 60,000 sq. ft. mill incorporates the latest equipment for dyeing and finishing including overhead monorail carriers and straight flow of work through the 4 sections of the plant. Equipment includes Blickman stainless steel dye boxes, Morrison Microset padders, Natl. loop dryers, and Morrison Duplex Sanforized shrinker.

Fire and accident prevention reduces costs. Anon. *Rayon & Syn. Textiles 30*, 91-3 (Oct. 1949).

The 2 chief elements of fire and accident prevention are mechanical improvements such as safety devices, sprinkler systems, etc. and educational work in training workers. Safety supervision and inspection, conditions contributory to accidents, protection of electrical equipment, etc. are some of the subjects discussed for mill safety.

Fluorescent lamp guard. Anon. *Factory Management & Maintenance 107*, 214 (Oct. 1949).

Note: Retaining spring-like device is intended to prevent the accidental fall of fluorescent lamps from open fixtures. Action is automatic; the unit is fully assembled and may be attached at the base of the lampholder. It is made in 3 models, to fit all types of fluorescent installations.

Improved water processing plant. Anon. *Textile Industries 113*, 111, 113, 115 (Nov. 1949).

An improved system for processing boiler feed water (at American Finishing Co.) is described. The system is reported to give reduced unit costs with less maintenance.

Latest types Swiss textile machinery. Anon. *Textile Recorder 67*, 61-76 (July 1949).

A comprehensive review is given containing technical descriptions and illustrations of the machines and equipment that were on view at the Swiss Industries Fair held at Basle, Switzerland, during May 1949.

Lighting for woolen and worsted textile mills. (Prepared by joint I.E.S.-A.S.M.E. Committee on Lighting in the Textile Industry). *Illuminating Eng. 44*, 364-73, 21A (June 1949).

As part of a continuing study of the lighting requirements for textile mills by the Committee, detailed recommendations on general and specific (general plus local) lighting levels and on preferred arrangement of lighting units are presented for the following processes: (1) in cloth production: opening, grading, scouring, drying, blending, picking, carding, gilling, combing, recombing, drawing, spinning, twisting, winding, warping, and weaving; (2) in the grey goods room: burling, sewing ,and folding; (3) in wet finishing: fulling, scouring, crabbing, drying, and decating; (4) in dry finishing: napping, shearing, conditioning, pressing, inspecting (perching), and folding. Results of tests in the Bachmann-Uxbridge mills are presented to show effects of lighting on production efficiency and spoilage for spinning and weaving.

Lighting of spinning frames (mules). Anon. *Illuminating Eng. 44*, 606 (Oct. 1949).

A photograph, a detailed sketch, and a brief technical description of the installation at the Bachmann Uxbridge Worsted Corp., Uxbridge, Mass. are given. General illumination sufficient in quantity and uniformity for rapid detection and repair of broken threads is provided by continuous rows of 40-watt 3500 K fluorescent lamps on 6′6″ centers, 10′6″ above the floor.

Materials handling-handle with care. Anon. *Textile World 99*, 136-37 (Sept. 1949).

Mistakes made by mills who attempted to install materials-handling equipment without a full knowledge of what they were doing are illustrated in the text and in cartoons. The advantages of acquiring the services of an outside consultant are discussed. A checklist for materials-handling installation is included.

Maximum "yarn-cum-waste" of cotton mills. Bhimashankar Prabhu Wani. *Indian Textile J. 59*, 1000-1003 (Aug. 1949).

In order to achieve maximum efficiency and production in a textile mill it is essential that both yarn and waste from cotton be extracted to the maximum. With this point in view the maintenance of daily cost statistics, consumption of raw material, waste extracted, useable waste reclaimed, invisible waste escaping, and absolute waste with all its individual percentages and inter-relations is important.

Modern principles of lighting. F. W. Lancaster. *Textile Industries 113*, 98-102 (Nov. 1949).

The principles of lighting that can be used to increase production, reduce seconds and accidents, improve cleanliness and neatness, etc. are presented. Included in the discussion are some fundamentals of illumination, the properties of surfaces, the effect of background, illumination surveys, and the need of a research department for illumination checks, etc.

Operating means for electrically driven textile machines. Eugen Törnros (to Allmanna Svenska Elektriska Aktiebolaget). USP 2 482 443, Sept. 20, 1949.

An operating mechanism for an electrically driven textile machine, such as flat cards, combers, stenters, etc., having means for controlling the lateral position of goods traveling through the machine, is claimed. The mechanism comprises a feeler directly feeling the traveling goods, a permanent magnet turned by the feeler and forming a circu-

lar disc having a part reduced in diameter and a groove all around the circumference of the disc, an armature for the magnet, a contact device with a spring moving the contact device in one direction. The device is operated by the armature against the action of the spring when attracted by the magnet when the latter is turned by the feeler so that that part of the magnet having the large diameter is before the armature. A stop device prevents the armature from touching the magnet.

Phenolics in the textile industry. Anon. *Brit. Plastics 21,* 526-34 (Oct. 1949).

The use of both laminated and molded phenolics by the textile industry as replacements for wood, metal, and leather is discussed. The advantages of these resins over conventional materials include: mass production, close tolerances, elimination of polishing to remove burrs, decreased weight of parts, and resistance to corrosive chemical conditions. Some of the end uses to which these phenolics are put include such items as bobbins, tension pulleys and cone mandrels, dividing and rotary traverse rollers, and warp beams.

Problems arising from the disposal of effluents containing synthetic detergents. H. H. Goldthorpe, W. H. Hillier, C. Lumb & A. S. C. Lawrence. *Chem. & Ind.* 679-82 (Oct. 1, 1949).

The purification of waste waters by sedimentation followed by a biological process is described.

Sample cutter for textile piece goods. Herman Hutten. USP 2 483 493, Oct. 4, 1949.

A sample cutter for cutting a patch from piece goods while the latter is in motion and under tension comprises a cutter head embodying relatively stationary and movable toothed cutter members and handle equipped lever means for handling the tool and actuating the cutters including an encasing sheath for the cutters, one lever being rigidly attached to the sheath and the other lever being hingedly mounted for relative movement on the sheath and the cutters being projectable and retractable in relation to the sheath and normally housed in an out-of-the-way and safe position within the confines of the sheath when not in use.

CHEMISTRY AND PHYSICS OF TEXTILE MATERIALS 1

Analysis of nylon and related polymers. M. Claspur & J. Haslam. *The Analyst 74,* 224-35 (Apr. 1949).

A method has been developed for the examination of nylon and related polymers based on hydrolysis of the sample with hydrochloric acid followed by determination of the proportion and properties of the resulting organic acid and base hydrochloride. Examples are given of the application of the method to 66 nylon, 610 nylon, 6 nylon (caprolactam), 66 nylon modified with formaldehyde and copolymers.

Buoyancy studies of fiber substitutes for kapok. F. M. Tiller. PB 16 390. Sept. 1944. *Bibl. of Technical Reports 12,* 27 (July 1949). 73 p. graphs. Limited supply mimeo, $1.00; thereafter Microfilm $1.00, Photostat $5.00.

Comparison of the water absorbing and drying characteristics of nylon vs. cotton. C. A. Willis. PB 97 276. Mar. 1949. *Bibl. of Technical Reports 12,* 61 (Aug. 1949). 6 p. graph, tables. Microfilm $1.25; Photostat $1.25; Mimeo 25¢.

Tests were conducted on 2 weights of cotton fabric and 2 weights of nylon fabric as follows: Plain weave nylon 9.07 oz./yd^2 vs. cotton duck 12.92 oz./yd^2, nylon twill 4.34 oz./yd^2 vs. cotton airplane cloth 3.85 oz./yd^2. (AAF TSEAM MR 666-13A.)

Effect of preliminary hydrolysis on the determination of lignin in jute. A. B. Sen Gupta & H. J. Callow. *J. Textile Inst. (Trans.) 40,* T650-55 (Sept. 1949).

A method for delignifying jute fibers without removing the hemicellulosic constituents is described. A comparison was made of the yields of lignin obtained from unhydrolyzed and hydrolyzed samples of jute, the hydrolysis being carried out with a 5% sulfuric acid solution at temperature of 2°C. A part of the investigation consisted of determining whether any lignin was removed from the jute by preliminary hydrolysis. The results obtained showed that hydrolysis with 5% sulfuric acid, prior to treatment with the 72% acid used for the determination of lignin, not only removes pentoses but also dissolves part of the lignin, indicating therefore that such a pretreatment is undesirable.

Electron microscopic examination of wool containing polymer. E. H. Mercer. *J. Textile Inst. (Trans.) 40,* T629-39 (Sept. 1949).

Electron microscopic examination of material obtained by the tryptic digestion of wool containing polymethacrylic acid shows the presence of typically fibrous cortical cells of both wool and polymer. From both optical and electron micrographs of the retted wool, the polymer seems to be

deposited during polymerization chiefly in the extra-fibrillar regions of the fibers. It was also found that since these regions are stretched first, the fibers are harder to stretch in acid and neutral solutions when the polymer is in a condensed and coherent form. In alkaline solutions the acid polymer ionizes and the complex is more easily extensible.

Formation of keratin during hair growth. E. H. Mercer. *J. Textile Inst. (Trans.) 40,* T640-49 (Sept. 1949).

Measurements of birefringence, x-ray examination, and special histochemical tests carried out on single hair follicles obtained from the human head led to the definition of the following zones in the formation of the cortex of the fiber: (a) Bulb region—the protein is soft, isotropic, digestible by enzymes, and dispersed by urea. (b) The fibrillation zone at the construction of the follicle —the protein is birefringent to the same degree as the final hair in a single stage. (c) The unconsolidated pre-keratinous zone—this zone is characterized by a positive thiol reaction and the structure is fully oriented but unstable. (d) Zone of consolidation—hardening becomes detectable, the protein only swells in urea, is not digested by enzymes, and is not disoriented at 90°C. (e) The fully hardened hair.

Investigations of the fundamental chemistry of cellulose and its derivatives. Richard M. Badger. PB 97 705. Quarterly progress report no. 7, Mar. 1-May 31, 1948. June 1948. *Bibl. of Technical Reports 12,* 68 (Sept. 1949). 12 p. graph, table. Microfilm $1.75; Photostat $2.50.

The fundamental chemistry of cellulose and its derivatives was investigated. Light scattering studies of nitrocellulose solutions were extended to samples of very high molecular weight. Greatly improved infrared spectra of the sugars were obtained by the use of a new technique, and cellobiose and cellotriose were investigated by the same procedure. Physiochemical studies on a cellulose derivative containing iodine were completed and show abnormal properties. Small angle x-ray scattering studies on these materials was resumed. Conclusive results are not yet available. (Work conducted at California Institute of Technology for U. S. Office of Naval Research. Task order No. 6. Contract N6-Ori-102.)

Investigations of the fundamental chemistry of cellulose and its derivatives. Richard M. Badger. PB 97 706. Quarterly progress report no. 8, June 1-Aug. 31, 1948. Sept. 1948. *Bibl. of Technical Reports 12,* 69 (Sept. 1949). 13 p. Microfilm $1.75; Photostat $2.50.

This progress report summarizes the work done on the following investigations of the fundamental chemistry of cellulose and its derivatives: light scattering studies, fractionation studies of nitrocellulose, infrared studies of carbon hydrates, cellobiose octa-acetate, α and β sugars, compounds having structural similarities to the sugars; a) the pyranose ring, b) hydroxy-cyclohexanes, c) hexitoles; and characterization of iodine containing cellulose derivatives prepared for x-ray scattering studies.

Reactivity of the sulfur linkage in animal fibers. VI—Cause of unshrinkability. A. J. Farnworth, W. J. P. Neish & J. B. Speakman. *J. Soc. Dyers Colourists 65,* 447-53 (Sept. 1949).

In order to test the view that reagents such as chlorine, sulphuryl chloride, and sodium hydroxide make wool shrink-resistant by promoting disulfide bond breakdown in the surface of the fibers, the action of these reagents on wools containing other types of cross-linkages in place of cystine were examined. Four kinds of treated wool were used in this study: (1) wool reduced with thioglycolic acid and treated with mercuric cyanide, (2) wool reduced with thioglycolic acid and treated with trimethylene dibromide, (3) alkali-treated wool containing lanthionine, and (4) wool treated with potassium cyanide. In all cases the modified wool was more difficult to make shrink-resistant than untreated wool. In the case of wool treated with potassium cyanide it was completely immune to the action of chlorine, sulphuryl chloride, or alkali. Since the action of potassium cyanide is to convert disulfide bonds into lanthionine cross-linkages the authors claim that without doubt that the reagents mentioned above make wool shrink-resistant by causing disulfide bond breakdown.

Reduction of swelling power of rayon staple. Spinnstoff-Fabrik Zehlendorf. PB 82 155t. Oct. 1948. *Bibl. of Technical Reports 12,* 27 (July 1949). 7 p. Available from Research Information Service, 509 5th Ave., New York 17, N. Y. Price $7.00.

Shrinkage of polyamide fibers in phenol. E. Elöd & H. Zahn. *Melliand Textilber. 30,* 349-50 Aug. 1949).

Continuing research on the shrinkage of polyamide fibers lengthways in a solution of phenol, the behavior of a number of commercial brands of polyamide rayons and polyurethane rayon in dilute

aqueous solutions of phenol at ordinary temperature was investigated, whereby it was found that contraction increases with the concentration of the phenol solution. There are noticeable differences between the individual polyamides, which may be made use of for their characterization.

Some aspects of polymer constitution and fiber properties. Anon. *Textile Mfr. 75*, 396 (Aug. 1949).

This is a review of a paper presented by Dr. R. Hill (I.C.I. Ltd.) at the annual meeting of the Society of Chemical Industry, Manchester, England, July, 1949. A synthetic fiber must be given a certain amount of lateral order, and inter-chain forces are required to maintain the chains in an ordered form, otherwise the resulting product can be classed as a rubber. In nylon this molecular orientation is produced to some extent by cold drawing. Nylon may be crystallized by heating in superheated steam, thus producing a high degree of both lateral and linear order.

Statistical note on the variation of porosity of nylon fabric to specification D.T.D. 556A. A. Glaskin. PB 97 637. June 1945. (Available from Brit. Information Services, 30 Rockefeller Plaza, New York 20, N. Y.). *Bibl. of Technical Reports 12*, 100 (Sept. 1949). 12 p. Price 90¢.

A large number of high-pressure porosity measurements have been made on twill and plain weave nylon samples and it has been found that, in general, the porosity across the width of a piece of fabric, along a line parallel to the weft threads, increases from a minimum value at the selvedge to a maximum at the center of the width. The difference between these minimum and maximum values are large compared with the overall range of porosity for the fabric. The variation is such that the mean porosity at a distance of 9 in. from the selvedge is very close to the overall mean porosity. The variation of porosity along the length of a piece of fabric, at a constant distance from the selvedge, is very nearly the same at all positions from the selvedge. It has been found that the porosity readings for each type of fabric obey the normal distribution law and in accordance with this law, the standard error of the mean obtained from a number of random readings is inversely proportional to the square root of the number of readings. It is shown that little advantage is gained in taking the mean of more than 10 random readings on a sample or parachute in order to assess the mean porosity of the sample or parachute. (ARC RM 2313.)

Structure of fibers. Chain molecules and their disposition. Crystalline and amorphous parts of fibers. H. J. Woods. *J. Textile Inst. (Proc.) 40*, P869-75 (Sept. 1949).

This is a discussion of the most important properties of chain molecules which include length, flexibility, and the power of attracting each other if brought close enough together sideways. Differentiating between the amorphous and crystalline structures by the use of x-rays is also discussed. Some mention is also made of fiber elasticity and the mechanism of this phenomenon is explained.

Textile auxiliaries. F. W. R. Wijbrans & J. Van Den Bosch. *Mededeling Van Het Vezelinstituut T.N.O. No. 92.* 25 p.; *in Dutch.*

This report is a summary of the results of investigations into the composition and the properties of some generally used auxiliary products. Their detergency, wetting-out, emulsifying and dispersing capacities and the stability to calcium, magnesia, acid and alkali have been determined. A precise method for the application of this method to comparative studies of textile auxiliary products are given.

Textile chemistry and physiology. O. Mecheels. *Textil-Runschau 4*, 271-79 (Aug. 1949).

This is an address discussing physiological aspects of textiles and textile chemistry, measurements of the warmth of fabrics, the effect of dyes, etc.

TEXTILE EDUCATION AND RESEARCH J

Fibers for fishing trade: Dutch research. J. Grindrod. *Fibres 10*, 354-56 (Oct. 1949).

The work carried out at the Institute for the Investigation of Material for the Fishing Trade is discussed. Every kind of material used in both sea and inland fishing comes within the scope of the Institute. The work pursued may be classified under 2 headings: the testing of materials for quality, strength and endurance; and research work on both new materials and new methods of manufacturing and processing.

Give your time study trainee new tools. H. R. Moore & C. Mallard Bowden. *Textile World 99*, 147-49 (Sept. 1949).

Boxes with button controlled lights, bells, and buzzers are used by mills in their time study training programs. These allow the teacher to vary his elements times and sequences at will. Other devices used are the Barnes pin-board and mock-ups of production machines. The need for ele-

ment break-downs is explained.

Helmshore Station of T. M. M. (Research) Ltd. Anon. *Silk & Rayon 23,* 1294, 1296 (Oct. 1949).

A description is given of the Helmshore Research Station, its layout, aims, and equipment. Research is being done on textile technology, textile engineering, and all branches of knowledge relating to them.

New policy of Textile Machinery Makers, Ltd. The research station at Helmshore. Anon. *Fibres 10,* 370-73, 376 (Oct. 1949).

A new research station established by Textile Machinery Makers, Ltd. will have 2 main objectives. (1) a new approach to some of the problems presented by opening, drafting, and spinning processes, and (2) to serve as a link between the development departments maintained by each of the operating companies in T.M.M. Ltd. Included at this research station will be a library, physics laboratory, technological department (blowing and spinning room and testing laboratory) and a textile testing laboratory.

Research in the wool textile industry. Anon. *Textile Mfr. 75,* 407-09 (Sept. 1949).

This is a summary of the research studies being conducted by the Wool Industries Research Association in the combing, drawing and spinning sections of the worsted industry as surveyed by B. N. Wilsdon in the annual WIRA report. To eliminate count variations in worsted drawing and spinning an auto-leveling device was developed which is coupled with a mechanism which alters the draft of the machine continuously according to the variations in weight per unit length of the sliver being fed into it. Research and developments in high draft spinning, woolen carding, yarn irregularity, and combing oils are also discussed.

Research work of the Indian Jute Mills Association Research Institute. Anon. *Fibres, Fabrics & Cordage 26,* 292-93 (Sept. 1949).

The London branch of the Research Institute has moved to larger quarters and the Headquarters is in the process of building large new quarters just out of Calcutta. Generally, the London branch carries on the fundamental research and the Calcutta Institute the applied research. Most of the fundamental research is done at Leeds University. Among the projects now underway are: the treatment of grain and flour sacks to render them proof against insects, and the reasons covering fading of bleached jute fabrics.

Some recent developments in cotton research at the Southern Regional Research Lab. Walter M. Scott, Southern Regional Res. Lab. *Textile Research J. 19,* 436-43 (July, 1949).

Prolonged heating of both cotton and rayon tire cords cause marked deterioration in a number of physical and mechanical properties, but embedding the cords in rubber definitely reduces the rate of degradation. Cotton cords show greater retention of strength than rayon cords after 256 hours at 120°C. A cotton tire cord which has high strength at elevated temperatures was developed by a practical modification of the mercerization process. A rotproofing treatment for cotton was developed which consists of reacting the cloth in a bath containing acetic anhydride, glacial acetic acid and a catalyst which converts part of the cellulose to cellulose acetate which is not palatable to rot-producing organisms. Other studies now in progress at the Southern Regional Lab. include the weatherproofing of cotton, production of water-resistant cotton by self-sealing through swelling and development of new properties through chemical modification.

Swedish Textile Institute. Sven Hultin & others. PB 95 855. *Bibl. Sci. Ind. Reports 11,* 406 May 1949). 47 p. illus, drawings. Microfilm $2.50; Photostat $6.25.

The founding of the Swedish Textile Research Institute, its physical plant and objectives are discussed. Summary in English.

Technical developments flow from research plant. Anon. *Textile World 99,* 93-7 (Aug. 1949).

The Textile Res. Dept., American Viscose Corp., has contributed much toward advancing textile technology. Contributions range from development of a paper cake cover to the introduction of quill winding from cakes. The organization of the department is described.

TRI '49—a progress report. Wm. A. Newell. *Textile World 99,* 132-33, 139 (Sept. 1949).

This report on the Textile Research Institute outlines some of the research projects under study. Among these projects are: a study of fiber damage in mechanical and chemical processing; why wrinkle-resistant-resin finishes damage the cotton fiber; an attempt to find a differential in physical and chemical properties of fine and medium wools; techniques for using radio-active tracers for measuring dyestuff and salt-ion pick up; absolute measurement of the molecular weight of cellulose. Besides a brief paragraph on each of the above and other projects, a brief report on the personnel and the functioning of the Institute is given.

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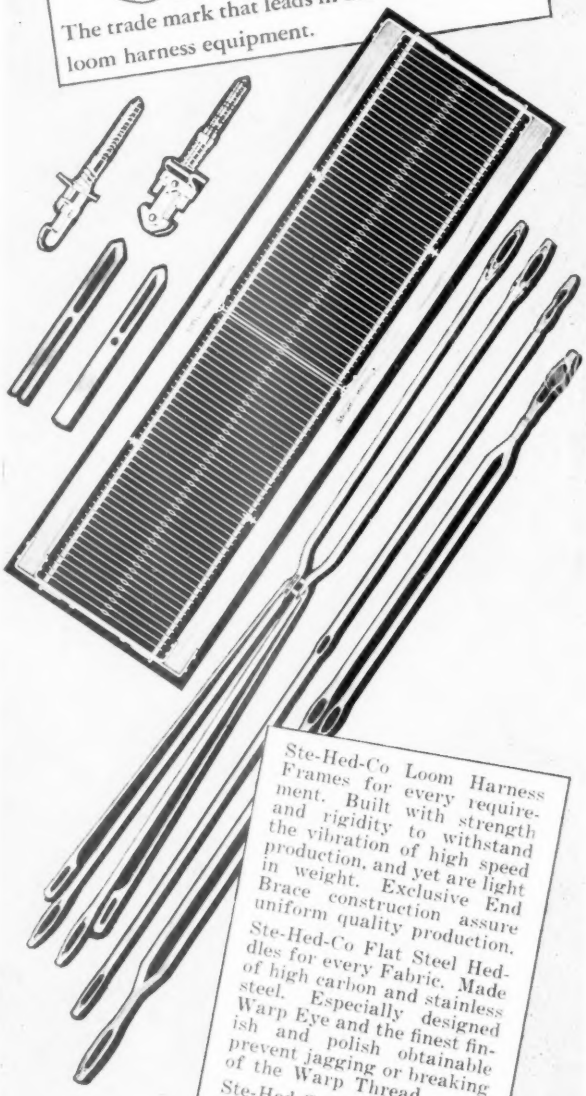

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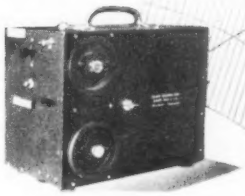

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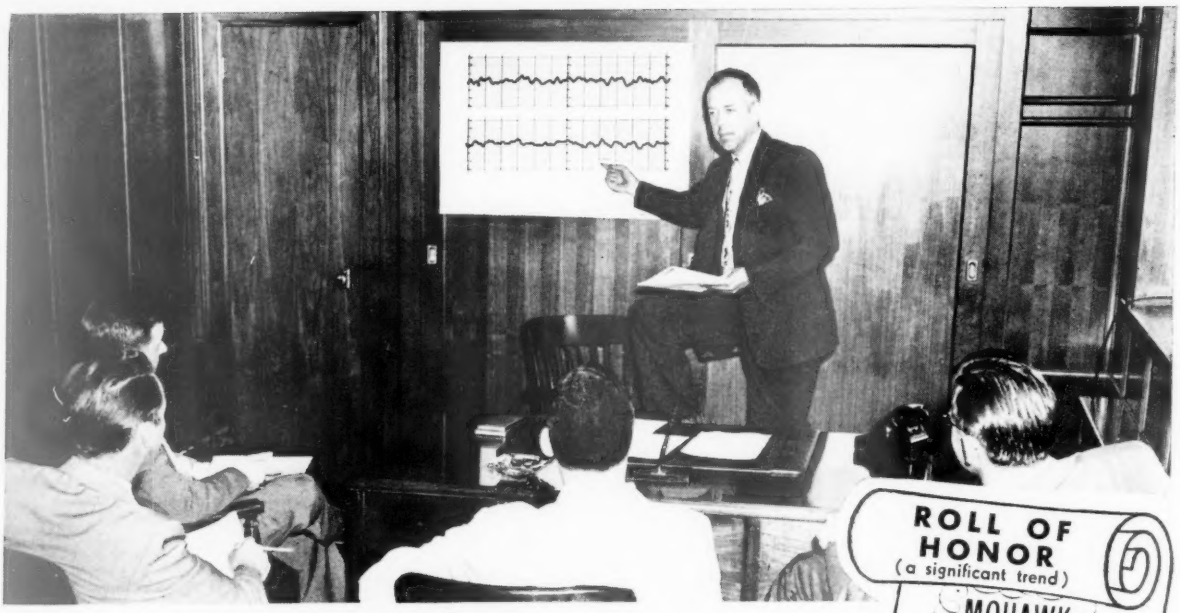

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2 457 450	363
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2 457 518	235
2 457 649	211
2 457 695	384
2 457 775	182
2 457 777	175
2 457 782	215
2 457 786	196
2 457 804	266
2 457 808	227
2 457 838	227
2 457 853	235
2 457 856	173
2 457 923	214
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2 457 956	297
2 457 981	219
2 458 021	201
2 458 166	481
2 458 243	363
2 458 326	195
2 458 374	178
2 458 379	206
2 458 389	226
2 458 428	396
2 458 451	482

2 458 732	277	2 460 875	387	2 462 847	457	2 465 254	615
2 458 773	230	2 460 879	428	2 462 927	426	2 465 319	522
2 458 801	217	2 460 899	348	2 462 933	431	2 465 336	571
2 458 852	189	2 460 938	357	2 462 950	429	2 465 386	594
2 458 886	397	2 461 043	351	2 463 028	441	2 465 408	594
2 458 926	239	2 461 084	384	2 463 111	610	2 465 465	851
2 458 936	211	2 461 090	445	2 463 122	774	2 465 496	659
2 459 052	293	2 461 094	347	2 463 166	447	2 465 520	573
2 459 063	793	2 461 105	462	2 463 258	848	2 465 575	618
2 459 134	238	2 461 138	371	2 463 272	434	2 465 615	543
2 459 164	483	2 461 204	373	2 463 278	669	2 465 649	548
2 459 167	289	2 461 231	443	2 463 484	439	2 465 689	549
2 459 222	327	2 461 240	372	2 463 497	785	2 465 818	602
2 459 240	255	2 461 387	369	2 463 591	607	2 465 852	546
2 459 254	274	2 461 404	353	2 463 604	520	2 465 916	626
2 459 270	270	2 461 470	360	2 463 604	672	2 465 996	611
2 459 291	301	2 461 493	450	2 463 618	610	2 466 036	624
2 459 309	285	2 461 496	450	2 463 619	531	2 466 066	571
2 459 345	382	2 461 497	450	2 463 620	531	2 466 109	609
2 459 547	350	2 461 546	361	2 463 636	686	2 466 287	621
2 459 595	368	2 461 550	456	2 463 639	933	2 466 332	617
2 459 617	364	2 461 572	352	2 463 673	693	2 466 348	637
2 459 620	376	2 461 575	906	2 463 676	746	2 466 446	710
2 459 622	634	2 461 576	431	2 463 689	536	2 466 457	648
2 459 623	382	2 461 583	454	2 463 740	523	2 466 536	628
2 459 720	301	2 461 586	442	2 463 751	556	2 466 597	629
2 459 738	322	2 461 593	443	2 463 773	535	2 466 600	609
2 459 803	338	2 461 602	348	2 463 887	533	2 466 606	678
2 459 814	295	2 461 603	393	2 463 904	542	2 466 615	677
2 459 831	309	2 461 632	397	2 463 923	548	2 466 649	593
2 459 874	311	2 461 724	375	2 464 009	527	2 466 656	568
2 459 896	320	2 461 841	429	2 464 024	532	2 466 695	571
2 459 897	320	2 461 851	452	2 464 126	848	2 466 797	612
2 459 924	341	2 461 860	457	2 464 128	744	2 466 806	602
2 459 952	354	2 461 952	360	2 464 301	559	2 466 808	613
2 460 050	299	2 462 108	446	2 464 342	645	2 466 852	541
2 460 206	391	2 462 108	446	2 464 360	570	2 466 857	558
2 460 209	365	2 462 156	460	2 464 425	527	2 466 861	532
2 460 261	271	2 462 159	427	2 464 433	539	2 466 871	522
2 460 318	372	2 462 166	467	2 464 453	557	2 466 872	521
2 460 319	367	2 462 177	423	2 464 468	552	2 466 906	558
2 460 372	354	2 462 178	339	2 464 502	611	2 466 911	556
2 460 377	351	2 462 288	456	2 464 518	844	2 466 933	550
2 460 390	347	2 462 310	362	2 464 536	612	2 466 944	540
2 460 400	430	2 462 326	369	2 464 624	544	2 466 951	612
2 460 448	335	2 462 376	394	2 464 882	530	2 467 093	634
2 460 487	374	2 462 380	712	2 464 885	519	2 467 186	592
2 460 512	367	2 462 428	392	2 464 897	525	2 467 196	521
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2 460 569	366	2 462 581	446	2 465 071	545	2 467 214	606
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2 460 736	362	2 462 826	408	2 465 180	576	2 467 260	620
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2 467 366	552	2 470 055	681	2 472 929	831	2 476 070	780
2 467 438	572	2 470 064	701	2 472 966	686	2 476 235	873
2 467 449	559	2 470 080	716	2 473 024	941	2 476 262	774
2 467 541	521	2 470 123	705	2 473 155	623	2 476 274	937
2 467 553	526	2 470 124	704	2 473 172	929	2 476 282	778
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2 468 279	600	2 470 453	876	2 473 503	934	2 476 640	698
2 468 304	540	2 470 506	698	2 473 521	608	2 476 736	688
2 468 310	557	2 470 527	700	2 473 607	689	2 476 780	940
2 468 370	519	2 470 549	687	2 473 615	595	2 477 053	709
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2 468 572	775	2 470 835	755	2 474 210	833	2 477 357	929
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2 468 870	612	2 471 354	696	2 474 717	784	2 477 745	765
2 468 906	614	2 471 362	702	2 474 785	790	2 477 779	797
2 468 908	620	2 471 380	707	2 474 890	788	2 477 996	843
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2 469 202	620	2 471 809	924	2 474 925	771	2 478 232	743
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2 469 348	792	2 472 057	938	2 474 967	868	2 478 283	842
2 469 360	932	2 472 142	805	2 475 012	778	2 478 284	764
2 469 407	650	2 472 175	936	2 475 019	754	2 478 379	780
2 469 408	650	2 472 226	833	2 475 059	766	2 478 560	761
2 469 409	651	2 472 238	749	2 475 083	853	2 478 581	777
2 469 452	596	2 472 240	682	2 475 170	769	2 478 743	858
2 469 466	628	2 472 283	914	2 475 241	779	2 478 763	846
2 469 590	744	2 472 335	645	2 475 486	751	2 478 799	829
2 469 640	626	2 472 375	713	2 475 505	694	2 478 926	755
2 469 658	682	2 472 511	940	2 475 549	695	2 478 927	755
2 469 717	616	2 472 584	947	2 475 672	790	2 478 928	756
2 469 756	618	2 472 614	936	2 475 724	681	2 478 939	775
2 469 764	593	2 472 649	937	2 475 725	686	2 478 940	773
2 469 767	597	2 472 772	696	2 475 845	770	2 478 960	750
2 469 961	625	2 472 842	592	2 475 895	754	2 478 974	773
2 470 039	592	2 472 877	639	2 475 943	843	2 478 979	750
2 470 042	647	2 472 927	658	2 475 987	764	2 479 049	781

2 479 168	753	2 482 270	949	2 484 545	960	129 314	145
2 479 275	794	2 482 319	947	2 484 598	959	129 359	99
2 479 285	845	2 482 363	923	2 484 599	959	129 367	96
2 479 303	803	2 482 407	942	2 484 604	908	129 378	110
2 479 401	754	2 482 425	940	2 484 668	935	129 415	96
2 479 403	810	2 482 443	975			129 495	100
2 479 478	776	2 482 446	921	**AUSTRALIAN**		129 535	121
2 479 497	754	2 482 470	883	**PATENTS**		129 537	113
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2 479 546	766	2 482 578	960	127 439	64	129 590	219
2 479 604	767	2 482 581	938	127 443	34	129 615	220
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2 479 759	749	2 482 647	943	127 485	38	129 679	186
2 479 826	754	2 482 670	930	127 504	35	129 680	235
2 479 845	762	2 482 682	943	127 522	66	129 705	208
2 480 004	776	2 482 683	941	127 535	2	129 714	231
2 480 010	792	2 482 689	927	127 553	35	129 734	183
2 480 067	741	2 482 690	927	127 560	17	129 744	218
2 480 084	796	2 482 691	927	127 618	62	129 746	201
2 480 175	932	2 482 755	957	127 649	38	129 761	207
2 480 214	920	2 482 756	957	127 727	28	129 762	214
2 480 219	913	2 482 764	973	127 751	13	129 790	207
2 480 231	931	2 482 811	934	127 848	33	129 808	233
2 480 316	942	2 482 816	957	127 929	40	129 814	216
2 480 491	910	2 482 854	908	127 953	27	129 815	212
2 480 493	954	2 482 889	919	127 972	26	129 890	181
2 480 602	901	2 482 941	954	128 039	66	129 897	233
2 480 690	928	2 482 943	923	128 056	25	130 001	231
2 480 779	971	2 482 975	929	128 101	9	130 067	217
2 480 930	958	2 483 008	959	128 169	1	130 084	232
2 480 936	913	2 483 118	925	128 214	66	130 127	182
2 480 943	936	2 483 320	912	128 308	57	130 135	205
2 480 984	941	2 483 321	912	128 350	5	130 147	217
2 481 043	911	2 483 330	938	128 352	27	130 150	232
2 481 048	903	2 483 355	931	128 365	28	130 161	218
2 481 185	915	2 483 378	916	128 394	41	130 166	213
2 481 197	917	2 483 490	916	128 447	63	130 221	234
2 481 205	909	2 483 493	976	128 651	51	130 311	233
2 481 237	919	2 483 587	937	128 653	42	130 340	190
2 481 316	943	2 483 756	931	128 717	52	130 424	183
2 481 369	945	2 483 840	925	128 718	52	130 431	223
2 481 399	923	2 483 857	924	128 766	35	130 513	298
2 481 436	920	2 483 931	909	128 845	29	130 534	305
2 481 450	935	2 483 987	926	128 848	42	130 584	318
2 481 532	958	2 484 016	915	128 920	13	130 652	264
2 481 619	915	2 484 020	944	128 979	9	130 672	315
2 481 718	930	2 484 065	926	128 980	53	130 750	348
2 481 812	927	2 484 119	926	129 043	62	130 814	363
2 481 992	947	2 484 125	939	129 076	11	130 815	375
2 481 998	911	2 484 293	939	129 108	42	131 012	399
2 482 149	924	2 484 303	919	129 122	39	131 057	357
2 482 164	838	2 484 334	944	129 125	25	131 091	398
2 482 236	856	2 484 380	921	129 202	5	131 111	358
2 482 237	855	2 484 522	932	129 307	143	131 143	374

131 176	377	133 889	916	445 471	531	447 076	599
131 178	399	133 909	956	445 478	519	447 174	630
131 238	364			445 487	766	447 212	605
131 585	435	CANADIAN PATENTS		445 491	551	447 213	533
131 630	448			445 492	551	447 234	569
131 729	444	444 386	112	445 513	553	447 274	558
131 768	825	444 396	37	445 521	620	447 277	557
131 804	864	444 417	61	445 548	525	447 308	745
131 869	547	444 418	144	445 563	558	447 310	523
131 904	520	444 434	92	445 591	554	447 344	746
131 905	518	444 461	42	445 661	573	447 392	775
131 926	551	444 471	26	445 662	572	447 403	790
131 927	721	444 474	11	445 737	566	447 422	770
131 943	559	444 489	121	445 738	520	447 559	768
131 954	824	444 524	113	445 739	566	447 640	746
131 970	557	444 555	125	445 742	796	447 654	788
131 974	542	444 562	124	445 795	941	447 673*	765
132 011	593	444 600	103	445 798	525	447 695	762
132 125	647	444 652	134	445 800	539	447 706	763
132 155	628	444 653	134	445 866	763	447 715	755
132 156	626	444 654	146	445 930	519	447 730	782
132 170	709	444 726	98	446 013	26	447 732	769
132 197	720	444 780	103	446 034	8	447 733	772
132 263	714	444 781	113	446 050	39	447 750	797
132 269	719	444 839	113	446 076	98	447 777	747
132 307	715	444 840	111	446 137	126	447 842	752
132 341	675	444 863	101	446 244	115	447 854	767
132 459	703	444 864	102	446 287	128	447 872	768
132 482	687	444 865	102	446 329	125	447 873	768
132 486	687	444 886	128	446 330	125	447 910	757
132 567	676	444 894	98	446 336	136	447 920	757
132 574	693	444 921	189	446 352	153	447 962	756
132 575	687	444 925	217	446 370	143	447 979	770
132 630	721	444 930	204	446 405	146	448 044	798
132 655	719	444 953	231	446 406	124	448 131	837
132 676	705	444 969	216	446 453	124	448 147	835
132 678	695	445 025	238	446 481	142	448 158	855
132 799	706	445 028	181	446 484	141	448 159	854
132 900	711	445 032	180	446 562	124	448 160	854
132 916	691	445 034	176	446 626	94	448 213	855
132 917	692	445 056	234	446 662	112	448 217	838
132 918	692	445 057	216	446 663	113	448 299	859
132 928	707	445 101	201	446 677	118	448 300	859
132 963	711	445 163	197	446 681	756	448 369	884
133 157	772	445 259	220	446 785	789	448 404	858
133 269	784	445 261	183	446 832	621	448 405	857
133 270	784	445 269	174	446 895	623	448 471	847
133 283	748	445 302	222	446 916	627	448 499	824
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133 656	931	445 338	215	446 996	622	448 716	856
133 786	872	445 356	204	447 006	611	448 768	855
133 806	871	445 395	249	447 010	629	448 778	850
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FRENCH PATENTS

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GERMAN PATENTS

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INDIAN PATENTS

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Column No.

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